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* Report of the Superintendent of Government Laboratories for the Year Ending August 31, 1902. (Appendix M of Third Annual Report of the Philippine Commission.)

* Report of the Superintendent of Government Laboratories in the Philippine Islands for the Year Ending September 1, 1903. (Appendix G of the Fourth Annual Report of the Philippine Commission.)

39. Third Annual Report of the Superintendent of the Bureau of Government Laboratories for the Year Ending August 31, 1904.

40. Fourth Annual Report of the Superintendent of the Bureau of Government Laboratories for the Year Ending August 31, 1905.

Bureau of Science—Publications.

101. Price and Exchange List of Philippine Bird Skins in the Collection of the Bureau of Science, Manila, P. I. (Effective January 1, 1908.)

102. *No. 1, 1909.*—A Check-List of Philippine Fishes. By David Starr Jordan and Robert Earl Richardson. *In press.*

103. *No. 2, 1909.*—A Manual of Philippine Birds. By Richard C. McGregor, Parts I and II. A systematic index to the orders, families, and genera. Paper, ₱8 for the two parts.

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THE PHILIPPINE
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VOL. IV JULY, 1909 No. 4

THE IFUGAOS OF QUIANGAN AND VICINITY.

By Fr. JUAN VILLAVERDE.

(Translated, Edited and Illustrated by Dean C. Worcester. With Notes and an Addendum by L. E. Case.)

The Spanish missionary priests who played such an important part in the civilizing of the wild tribes of the Philippines had a wonderfully favorable opportunity for ethnological work. It is greatly to be regretted that most of them did not deem their observations relative to the manner of life of these peoples to be of sufficient importance to be recorded and perpetuated, but, as a matter of fact, they did not.

However, every rule has its exceptions. Fr. Juan Villaverde was born in the Spanish Province of Navarra on June 23, 1841, was sent as a missionary among the Ifugaos on February 3, 1868, and remained in or near the Ifugao country until the early part of 1897, when he contracted the illness which resulted in his death on July 8 of the same year. He has written a very interesting and valuable account of the Ifugaos of which a translation follows.

In referring to these people, Fr. Villaverde almost invariably employs the word "Igorrotes." As this is the name applied generally to the hill people of northern Luzon by Spanish writers, I have invariably substituted for it the word "Ifugaos" now ordinarily employed to designate the "Igorrotes" of this particular region.

Fr. Villaverde's account of the Ifugaos forms a part of his *"Informe Sobre la Reducción de los Infieles de Luzón,"* written in response to a request for information as to practical means for subjecting the non-Christian tribes of northern Luzon and organizing them into Christian towns, sent out by the Superior Government of the Philippine Islands.

It is worthy of more than passing note that the suggestions made by Fr. Villaverde relative to the means which might be employed to civilize the Ifugaos were of a highly practical and most sensible nature, and that many of them were directly in line with the policy looking to this end which has since been so successfully carried out.

Captain L. E. Case, of the Philippines Constabulary, was stationed in the Ifugao country for a period of four years, having his headquarters at Banaue during the greater part of this period. I have submitted the translation of Fr. Villaverde's article to him for comment, and his observations thereon, as well as a few of my own, have been added in the form of footnotes.

Since the American occupation, work for the civilizing of the Ifugaos has progressed with a rapidity which is remarkable, considering the difficulties to be overcome. It is believed that there are fully 101,000 of these naturally wild and war-like people, and they occupy one of the most inaccessible and rugged mountain regions in the entire Philippine Archipelago. Captain Case was himself remarkably fortunate in winning their good-will and respect, and gave a very strong impulse to the work looking for their betterment. His successor, Lieutenant Jeff. D. Gallman, of the Philippines Constabulary, has been extraordinarily successful in forwarding the work thus auspiciously begun, and in recognition of his very valuable services has recently been appointed lieutenant-governor of the subprovince of Ifugao which has now been segregated from Nueva Vizcaya and added to the recently established Mountain Province.

Within the past few years an extensive system of trails has made the territory occupied by the Ifugaos comparatively accessible, and the friendliest relations have been established with them. At this time (May 14, 1909) there has not been a human head taken in the entire subprovince of Ifugao for a year and a half.

With two exceptions the photographs with which this article is illustrated were taken either by the Government photographer, Mr. Charles Martin, or by myself.

The translation of Fr. Juan Villaverde's article follows.

DEAN C. WORCESTER.

OCCUPATIONS OF THE IFUGAOS OF QUIANGAN AND THE NEIGHBORING REGIONS.

The Ifugaos live without forming any society which is worthy of the name, grouped in settlements for the most part subdued. In the less rugged mountains, where they cultivate rice, these settlements are frequently large; and according to the testimony of eyewitnesses there are numerous other settlements in the main part of the cordillera.

In Quiangan,[1] which is one of the large and less rugged valleys, some of the settlements have 90 to 100 houses, others 30 to 70, and others less. (Plate I, fig. 2.) The houses all have the same architectural plan, not beautiful to be sure, but with sufficient solidity to prevent the entrance of wind and rain. They are rectangular, of about three meters on a side. They are sustained by four posts, a meter high, or a little more, which, while hardly put into the earth, support the house firmly in spite of the strength of the winds. The greater part are of rough boards. Some of them are made of bamboo, but with the floor of boards. (Plate III, fig. 1.)

The Ifugaos of Quiangan and other neighboring regions prefer to cultivate rice where the ground permits, that is to say, wherever they can get spring water for it. As the land is never, or almost never, level, they build various terraces, more or less high, called *"pilapiles,"* in order to make small level surfaces where they can sow rice and keep the water standing, as the culture of this plant demands. They sow it in January or February, or when the rainy season is over. It is of a special quality, very good and with large grains, and it does not give a good crop if planted at the time the Christians of the valley plant their rice. The Ifugaos accordingly let the heavy rains pass, and take advantage of the water of high springs, brought to their fields with much work and no little skill. For this reason, they lose their harvest, or get very little, in the years of drought, without taking account of the plagues of rats which exist in the mountains, eating great quantities of the grain in spite of the beautiful precautions which they take to exterminate them.

Returning to the *pilapiles,* which are the only means of controlling the inclined slopes of the mountains, it is not easy to appreciate the work which they necessitate. On the gentler slopes of the mountains they are of earth, in the shape of sloping banks whose height varies from a meter to a meter and a half. (Plate VI, fig. 2.) When the land allows this class of *pilapiles,* which happens only rarely, it is considered excellent and easy to work. More usually there is need of *pilapiles* made of stone, after the fashion of dykes slightly inclined inward, these having to be higher and more numerous as the slope of the mountain becomes more steep. Sometimes they are more than 4 meters high, although in Quiangan I have not seen them so high as this. Often their height is greater than the breadth of the space which they inclose, and the Ifugaos do not hesitate at the tremendous work involved. (Plates IV and V, and Plate IX, fig. 2.) The trouble is that they do not even find *such* ground with water above it, except by buying it at fabulous prices, on account of its being all occupied and private property. Ownership in it is never lost, although the land remains uncultivated for many generations.

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[1] Now usually spelled "Kiangan." (Dean C. Worcester.)

The Ifugaos never make use of the plow in cultivating the soil. They do all their work by hand with large wooden shovels. (Plate VI, figs. 1 and 2.) Their hard work begins in Quiangan about September and ends in January and February which is the time of sowing. This leaves out of account the fact that they have first to clear the ground of the strong underbrush which grows in the four months of rest, and which, after the sowing of the rice, must be continually removed down to the smallest shoots, which otherwise serve to cause the rats to dig holes. How dearly the small amount of rice that they eat costs them! Yet after spending the greater part of the year at this work, still they do not get enough to maintain them, having to supply this lack by borrowing at a horribly usurious rate.

The poorest settlements of other mountains which are very rugged maintain themselves on sweet potatoes, but on the other hand their labor is incomparably less, and the women ordinarily perform it. Sweet potatoes, which grow everywhere, even in mountains which are extremely rugged, are the reliance of the lazy. The latter are at the same time the ones who are accustomed to steal from the granaries of others rice, as well as the quadrupeds and domestic fowls which others raise with great care. They are the bad people of the country as the Ifugaos say. It surprises me that when they might maintain themselves so easily on sweet potatoes, gabi, or Indian corn, they should carry on such hard and difficult work for a little rice. In contrast with their more than barbarous and vicious customs stands out the habit of industry, it being a shameful matter among them not to eat rice, and he who has it considers that he has lowered himself if he plants sweet potatoes.

MANUFACTURES AND INDUSTRIAL RELATIONS AMONG THE IFUGAOS.

There are among them smiths (Plate VII, fig. 1), who know how to temper and work iron, making axes, very rude indeed, but which serve them at the same time for adzes and chisels; also *bolos* or *campilanes* which are very sharp but dull easily on account of not being made of steel. Finally they make lances (Plate VIII, fig. 2), as well as small knives to harvest rice. They use musical instruments called *gansas,* which are similar to timbrels, and are ordinarily made of iron. These gansas are much used, and they as well as the better lances are, I believe, made at a very large settlement in the valley of Japao (Sapao) to the north of Quiangan.[2] In addition to the *gansa* they are accustomed to use a sort of flute of bamboo which they play with the nose. From the cotton which they gather the women weave certain coarse and narrow pieces of cloth from which they make their skirts and a sort of jacket without sleeves which they wear in the cold season. (Plate IX, fig. 1.) The Ifugaos eat with the spoon in distinction from the natives of the plain who eat with their fingers. They carve the spoons sometimes with very objectionable figures in relief (Plate X); so also they carve roughly the images of their false divinities (Plate X).

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[2] Padre Juan was mistaken in believing that gansas are made at Sapao. So far as is known they are not made anywhere in the Philippines, all those that exist having been imported from China or the Straits Settlements. They are invariably made of brass or bronze. (Dean C. Worcester.)

For their work in the fields they are accustomed to gather in groups of six, ten, or even twenty individuals, all relatives or friends, who work one day for one and the next for another; the one for whom they work furnishing food for all. The most influential get laborers by paying them in hens, chickens and rice, the food being at the expense of the one who manages them. They exchange, also in the same way, in their small buyings, sellings and other operations indispensable for life. I must not omit to state that the Ifugaos of Quiangan even buy wood, because all the little neighboring forests are private property. On the occasion of marriages and deaths, and at various other times, they hold frequent reunions in which they eat the flesh of fowls, hogs and carabaos (the latter old and coming from the Christian towns) with the indispensable accompaniment of drunkenness caused by a drink made of water and rice boiled a little, and left to ferment; a very bad drink because it causes a rabid drunkenness, a source of very many misfortunes.[8]

NOBLES AND PLEBEIANS.

I have already said that the Ifugaos have no king, nor ruler. They pay tribute to no one. Each one is the absolute monarch of his house and person, and although this individual liberty is one of the principal causes of their miserable and almost anarchical state, it is certain that it is one of their most dominant passions. But although this is so, nevertheless there is among them a certain class of nobles who exercise in greater or less degree prestige and moral authority over those regarded as plebeians. This class is founded on the power of riches, receiving greater respect if the rich man has acquired a reputation for bravery by killing people and cutting off heads. It makes no difference if he has employed treachery to this end, for dishonesty and meanness, so repugnant to the heart of civilized society, are not recognized among the Ifugaos; on the contrary they are accustomed always to attack from behind, not doing otherwise unless by virtue of necessity.

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[8] Curiously enough, Padre Juan has failed to make any mention of the dancing which is so important a part of all these celebrations. The music is supplied by *gansa* players, usually three in number who may stand close to the dancers but more frequently are half hidden among the spectators who gather in a dense circle about the performers. (Plate XI.) The dancers usually move in a circle, in single file. Several men or several women commonly dance at one time, although mixed groups of dancers are by no means uncommon. Ifugao dancers not only keep perfect time to the music with their feet, moving forward as well, but spread the arms, indulging in much flexing of the arms and wrists and moving of the hands. (Plate VIII, fig. 1.) (Dean C. Worcester.)

The Ifugaos can ascend from the plebeian to the noble class by acquiring riches and making an ostentatious display of them before others in the following fashion: The candidate for noble rank announces his intention beforehand to those of his settlement as well as to his immediate neighbors, and at once they all come forth with great satisfaction and enthusiasm for the dinners that they expect. They go to rather distant forests, and, selecting a very large tree of good wood, make from its trunk a ridiculous figure, similar to a large quadruped, stretching upward with its extremities cut off. While they are making this sign of nobility they continually kill and eat hogs and *carabaos* which the future nobleman pays for with great evidence of generosity. When the work of art is concluded they leave it in the forest and return to their settlements with great glee, eating the flesh of hogs or *carabaos* always at the cost of the one who wishes to become a noble. When the work in the fields is concluded they return again to the forest in order to carry to the settlement the image previously prepared, which they call *tagábi*. (Plate VII, fig. 2.) Then it is that the candidate turns his house inside out in order to acquire a reputation for magnificence among his future inferiors. After eating to excess, and going through with a thousand ridiculous ceremonies, they load the *tagábi* upon the backs of men and begin to walk very slowly to the sound of the *gansa* with great shouting, and as a further proof of riches the future noble goes scattering rice in the path. They leave the *tagábi* in the forest, returning to their houses a third or even a fourth time, finally arriving at the settlement in the midst of an indescribable enthusiasm. When the *tagábi* has been placed under the house of the noble there begins another feast much greater than those which preceded it, during which many hogs and buffaloes [4] are consumed, until the people take their departure drunk and full of meat to their throats. Nobility therefore among the Ifugaos costs them dear, and they spend their fortunes in acquiring it, although they come back to them afterwards with interest. In order to maintain their prestige over the plebeians or poor people they repeat from time to time some little celebration, always enveloped in gross superstition, and without forgetting the inevitable drunkenness which is an honor among them.

When for this or other reasons they kill a *carabao*, the mode of doing it is horrible and is as follows: The animal is tied in front of the house of the man who gives the feast. The guests are arranged (and everyone comes who wishes to take part); they have knives in their hands, and await impatiently the first blow by the owner on the head of the victim. When this has been given, they all rush up like carniverous animals in order to cut off good pieces, which they carry to their houses. (Plate XII.) In the wink of an eye they cut to pieces the *carabao,* which, kicking and bellowing passes instantly into the hands of his voracious enemies in the midst of horrible confusion and tremendous outcry. They get very angry when they can not obtain any meat. Some of them take away from others, if they can, what the latter have obtained. (Plate XIII.) The most audacious threaten the more timid with the knife in order to make them abandon the prize, and almost always some of them get wounded in order to eat a little meat. But it is the custom that he who is wounded shall bear it, because the action is considered involuntary. They carry away even the contents of the intestines as a thing which pleases them greatly. The nobility acquired and preserved in this manner endures only while the riches last. These for the most part are not handed down to the descendants, although the latter are called always "sons of nobles," a fact which they appreciate highly.

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[4] The word "buffalo" throughout this article refers to the *carabao*. (Dean C. Worcester.)

VENERATION FOR THE OLD, CONSIDERATION FOR WOMEN, AND RESPECT OR LACK OF CONFIDENCE AMONG THEMSELVES.

They have great respect for the aged, even regarding them with superstitious fear, the reason being that they are their priests and diviners, and the interpreters of their idolatrous customs to which they are very closely wedded. This is the circle by which is limited the authority of these old people without its reaching even indirectly individual liberty, and the usages of life. In case of invasion by enemies, they exert a moral influence, the Ifugaos following the bravest and those of the strongest character; guided in this rather by the spirit of self-preservation than by respect and veneration. For the rest, if one did not wish to do his share for fear or other motives, nothing would happen to him except blushes and shame, of which they make much account.

Women are held in high respect, so much so that in case of a war between family and family, settlement and settlement, or those inhabiting contiguous territories, the Ifugaos of Quiangan do not attack women or children, avenging themselves only on the men of adult age.[5] The women and children can go where they like without any fear.

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[5] The Ifugaos of Quiangan have no more respect for women and children than do those of other regions. They will all kill women and children of their enemies and take their heads whenever they get the opportunity. All through the Quiangan Valley the people of the different rancherías are intermarried. The Ifugao does not hesitate, in a spirit of revenge, to kill a male relative, but I have never known him to kill a female relative. This fact possibly accounts for the theory that the Quiangan Ifugaos do not molest women and children. (L. E. Case.)

It is the custom of the Ifugaos to regard as unendurable the slightest bodily punishment. Not only this, but they can hardly endure a word which among the Christians passes almost unnoticed, and it is extremely dangerous for them even to get to joking with each other, especially if they are strangers or not related. The Ifugao is, and believes himself, an absolute king, avenging with his ever ready lance the smallest offense not only against his person, but also against his house and his estate. In the intercourse which they must necessarily have with others they are very circumspect and reserved, especially with strangers. I do not mean to say by this that their manners are fine, for they do not even know words and salutations, and comport themselves like wild beasts when they meet each other, but I do mean that in their extreme barbarism they fear to compromise themselves in matters which do not concern them, and they know that if they do not know how to endure, the same thing is true of their fellows.

For example: When a military expedition was encamped in one of these mountains, various Ifugaos of influence came down to present themselves to the leader, bringing him presents. It occurred to one of the expeditionary force to play a joke on an old man, pulling out some of the few hairs which he had in his beard. This was enough to make him furious, although he was in the midst of the encampment, and he gave the war cry to the others, although, coming in friendly spirit, they did not carry lances. The result was tremendous confusion. More Ifugaos came up and the forces had to deploy and fire until they drove them away. All this was the result of an unimportant joke. I heard this from a person who saw it.

On another occasion, in a settlement somewhat removed from Quiangan, individuals did not wish to pay homage nor to aid in certain public works that were being constructed. As a result a few soldiers were sent from the fort to compel them to obey, but when they reached the settlement they found only an old man; all the rest had fled. It occurred to a soldier to make fun of certain idols, and furthermore to catch a few hens in punishment for their rebellion, whereupon the old man with fire in his eyes, attempted to sheath his dagger in the breast of the soldier, without fear of the rifles and bayonets. Other similar instances might be enumerated, as well as accidents which have occurred on expeditions for insignificant causes of this sort, especially when women were insulted in the smallest degree. I think I have said enough to show that it is not easy to have to do with these Ifugaos without knowing thoroughly their instincts and character, and it can be understood why the missionary priests are almost afraid to have detachments of troops in the missions, especially since in other ways, and working with wisdom, their submission might be brought about gradually.

EDUCATION OF CHILDREN.

In order to make more clear what I have said concerning the ferocity of character of these Ifugaos, it is well to indicate the difference which exists between those who live on sweet potatoes in the more rugged and distant mountains, and those who are accustomed to work in the fields in the cultivation of rice. Nevertheless, even these differences are difficult to detect. Speaking of those to the north and east of the Cordillera, those of the southwest, although they only give themselves to their gardens of gabi and sweet potatoes, are more timid and docile as I was able to observe in the journeys that I made through their mountains.

From birth they are accustomed to do as they please in every thing on account of the extremely bad education which they receive from their parents, who, although they hate like death the least domination on the part of strangers, submit like slaves to the caprice and insolence of their children. The children give orders in the house, and if at some time their parents do not yield to their stupid caprices they begin to cry furiously, and immediately their parents hasten to quiet them, giving them a thousand caresses, and in addition allowing them what they ask. They do not whip or punish them as do the Christian natives. The lightest slap is not employed among the Ifugaos, and would be received very badly and criticised among the others if it should be observed at any time. The most that happens, especially with the women—the mothers—is to shout at them, when their caprices are too repugnant and prejudicial to the interests of the house, but they gain nothing by this, because if they (the children) are small they only weep the harder, and if they are larger they pick up stones or lances, and attack their parents, driving them out of the house, to which they do not return until they see the children pacified and quiet. It seems incredible that people so hard and cruel with strangers should be so sensitive and affectionate with their own. Nevertheless, so it is, as is proved by experience. Wild beasts, also, in spite of their bloody instincts, love their offspring tenderly and risk their lives for them.

MARRIAGES.

The relations which these Ifugaos maintain hardly deserve this name. They divorce themselves as readily as they marry, the men seeking other wives and the women other husbands. The Ifugaos seldom grow old without having changed their wives one or more times. The slightest annoynace, the least caprice, a single word, is frequently enough to dissolve the contract, but the most influential and common reason on the part of the man for divorcing his wife is barrenness, and the commonest reason on the part of the wife for divorcing her husband is laziness.

In order to get married a man must make presents of considerable value in cloth or similar articles to the uncles of the women, and in lack of these to the brothers or cousins. When he wants to marry another wife because the first has died, or because he is obliged to abandon her, he must again make the same presents to the same people, adding a *carabao* in compensation for lack of respect to the departed one or for the abandonment, if she still lives. He has also to make the same presents to the uncles, brothers or cousins of the second, and so on successively. The expenses and feasts which occur on such occasions are also at the cost of the man. It seems that they ought to cut down expenses, on account of changing wives so frequently. But it makes little impression on them, because they are very obstinate and capricious.

JUSTICE, DEFENSE AND VENGEANCE AMONG THE IFUGAOS.

There does not exist among them any superior authority to defend them or to punish their mutual aggressions. Each one supplies this deficiency after a fashion with his lance, and this in the hands of so fierce a people is the cause, in turn, of an infinite number of misfortunes and cruelties.

For every murder committed, although it be involuntary, inexorable vengeance follows, carried out by the relatives of the dead person, on the author or some one of his nearest relatives. Among the Ifugaos vengeance is a rigorous precept which must be fulfilled. When a plebeian or a rustic, as they say, kills another rustic, justice is satisfied by the death of another of the same rank. In case the murdered man is an important person or a noble his relatives are not satisfied by killing the aggressor if he is rustic, or by killing some relative of the same rank, for they say how will there be equality if we only kill this fellow who is like a dog? Therefore they look to see if there is among the relatives of the rustic some important person in order to wreak their vengeance on him, and, if not, thinking it beneath them to kill those whom they regard as dogs, they wait until some of them ascend to the rank of headmen. It results that an act which is originally individual becomes always a question of family, even if it does not involve the whole settlement, as often happens. When the death, or deaths have been avenged, by others equal in number and rank, the individuals of one and the same family and even of the same settlement are wont to quiet down and become friends, either in the desire of self-preservation or because they weary of perpetual ambushes and surprises, with the consequent harmful results to their crops and their interests. For the rest, between those of different mountains or districts, and especially between those who give themselves on the one side to the cultivation of rice and on the other to that of sweet potatoes, there exist interminable hatred and wars ever more bloody, the men going forth to kill their fellows as if they were going to hunt deer or hogs, and afterwards carrying the heads of the victims to their settlements, making great feasts, honoring themselves with the name of "the brave," and decorating the fronts of their houses with the skulls of their victims.[a] (Plate III, figs. 1 and 2.)

If it is a matter of wounds which are not fatal, or of other assaults, the matter is arranged readily with the healing of the injuries caused. The frequency of deaths and wars even among the families of a settlement, may be imagined when one takes into account the egotism and independence of this barbarous people, their brutal manner of living, the commonness of drunkenness, and the fact that they hold as honorable their gross errors, their idolatry and their superstition.

IDOLATRY AMONG THE IFUGAOS.

I have proposed at various times to follow the course of the stories and narratives of these Ifugaos, and noting at every step monstrous contradictions and violent transitions, I questioned them to see if they could follow the thread of the discourse, but always in vain, for they answered me that they did not know the reasons of these transitions and contradictions. It is to be noted in some of these narratives that this race has possessed in very remote times remarkable astronomical knowledge, especially of the signs of the zodiac, and I believe that even now, if one were to go deeply into the meaning of their little stories which are handed on from generation to generation by means of a sort of traditional verse, which they very often sing, he might perhaps determine with considerable accuracy the epoch of the arrival of the Malayan race in these Islands.

They pay great attention to the spots and the phases of the moon. They believe that certain planets influence more or less the affairs of man. Observing the different phases of the moon, they suppose them to be two distinct entities, husband and wife, whose older children are the various planets which appear larger to our sight, the younger children being the remaining stars of the firmament. For the same reason they ought to imagine that there are two suns. These Ifugaos establish very easily relations among things, taking as a base the male and a female which they call husband and wife, for to everything which appears large and important it appears that they attribute intelligence. Even when they see two conspicuous rocks or mountains which are similar and near together, they believe thus in mutual marriage.

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[a] As for taking heads, this is only done between rancherias which have a feud or are strangers. If an Ifugao from one rancheria kills another from a friendly rancheria in a dispute it is only a family affair; but if he should cut off his head it would then become a rancheria affair and the feud would begin. An ordinary killing is generally fixed up by the exchange of a few hogs or of other property, but when a head is taken the rancheria from which it was taken must get a head in return. It makes no difference whose head it is so long as it comes from the rancheria which took the first head. Of course the more important the victim whose head is taken the better pleased are the avengers; still they will lose no time in waiting for an important person, but will take the first opportunity that presents itself to secure a head, whether it be that of a man, a woman, or a child, and if the party is large and its members wish to secure more than one souvenir over which to hold their *cañaos* they will cut off feet, legs, arms, or hands, and carry them home. I have had Ifugaos urge with tears in their eyes that if I objected to their cutting off the head of a man who had been killed in a fight I let them cut off only a finger so that they would have something to take home and give a *cañao* over. (L. E. Case.)

There is no notable phenomenon in nature which does not arouse in them serious fears which hold them enslaved in all their movements and operations, although they find a universal remedy in the sacrifice of birds, hogs and buffaloes, whose entrails they study uselessly before introducing them into their own voracious stomachs.

They believe in two places to which they go after death. For those who die a natural and ordinary death they believe the abiding place to be in the earth and toward the north, calling it *Kadungayan,* the word by which they designate the northern region. They say that the dead live there reunited in a forest of special trees, which, although they appear by day as such, become converted into houses similar to those of living Ifugaos when the obscurity of night arrives. They are positive that they have gardens of sweet potatoes and other vegetables and that the spirits eat the invisible substance of the animals, rice and other things which their living relatives offer them. Thus, they say that the wine which the living drink serves as a drink for the dead, each getting what belongs to him according to his state. They affirm that those who rob or kill without reason receive here their deserts, and if one dies without paying the penalty the same conditions will continue in the towns of the dead as in the living. He will pay there for his fault with some lance thrust which one of the dead will give him. When the story has come to this point, to which only some old and wise man is able to bring it, they do not answer further. If one attempts to go on they only destroy what they have said with monstrous contradictions. They say that some of the spirits from that region come back to visit the place and settlements of the living Ifugaos. One of them, according to the story, came with his wife to visit his relatives who maintained them with the most excellent rice flour. When the relatives got tired of such heavy expense they sent them away, it is not known where, and they finally came to rest on one of the mountains of the Mayoyaos to the east of Cauayan in Isabela. While the man was sitting on a rock in the shade of a tree there fell upon his head the droppings of a bird which was perching there, from which it resulted that while he remained seated there burst forth from his very head a tree that they call *basisi,* from the bark of which the poor Ifugaos make their skirts. This tree grew very large and still exists over the sitting Ifugao. Two ladders represent them; the one this man, and the other, I believe, his wife. The Ifugaos are wont to have them at the entrance of their granaries as guardians and protectors of the rice. They offer or place before them a little rice flour during the feast which they make at the end of the harvest, while they are filling up on the flesh of hogs and buffaloes and are getting as drunk as possible. Those who die from lance thrusts or who die any other violent or sudden death, as well as women who die in childbirth, they assign to heaven, or the abode of the gods which they worship, and they mean by heaven, or the abode of the gods, the stars and planets, especially the sun. They give the following account of the origin of the sun. The Lord of the Sun, whom they call Mananahagut, gave orders that certain Ifugaos should go and kill another one for some fault or other, the Ifugao in question being left, as a result, dead and headless. Lord Mananahagut, moved, it would appear, by compassion, sent his wife, Bugan, charged to invite him and persuade him with gifts and caresses to ascend into heaven, but the spirit of the Ifugao refused the caresses, and refused to go to heaven, in spite of the beetle nuts, tobacco, and *vino* which were given him, because the woman was peculiarly dressed and looked very strange. The wife of Mananahagut, noting this, disposed of the greater part of her clothing, remaining half naked, as is the custom with the Ifugaos, caressing further the dead Ifugao, and offering him endless pleasures in heaven. Satisfied with this, the Ifugao accompanied her immediately to heaven being received with the greatest joy by Lord Mananahagut, who gave him splendid feasts and dances. For this reason, and I know not for what other, the Ifugaos believe that people who are killed by lance thrusts go to the abode of the gods, but although in said place they are happy, their happiness consists in filling themselves with the flesh of hogs and *carabaos* and in drinking, and getting drunk on the *vino* which they make. Neither for their gods nor for the souls of the dead, nor for those who live in mortal flesh is there any greater happiness than the satisfaction of the carnal appetites. The practices and ceremonies which they employ with the dead vary, according to whether the deceased died a natural or a violent death. For the first they spend all and more than they have, ransacking the neighborhood, gathering hogs, *carabaos* and *vino*, which they give to eat and drink to all their relatives, because they believe that the souls or the spirits of the animals which they eat are the food of those who go to *Kadungayan*. They keep the body four, six, ten and even fifteen days without burial, placed below the house. All depends on the rank of the deceased; the more important he was the longer he is left without burial. But when they bury those who go to heaven, especially the trunks of the corpses the heads of which have been carried away by the enemies who have killed them, they only kill the hog, which is eaten by some of the oldest and most experienced in the rites which they have practiced, because, they say, those who go to heaven get no good from the spirits of the animals which their relatives eat, but, on the other hand, the animals which the assassins kill and eat in the great feasts which they celebrate, when the brave are crowned, serve for the spirits of those whom they have decapitated. They say that the Ifugaos die twice, understanding by one of the times their falling sick. They affirm also that the spirits do not go immediately to their final destinations, but that they remain for a longer or shorter time near by, leaping from rock to rock, and from tree to tree, maintaining themselves on the remnants which they can obtain by entering the houses at night. The object of remaining in this way is to see if they can take with them the spirits of their relatives, in order that husband and wife may live together, and that children may live with their parents. In consequence, they believe also that sickness consists in the departure of the spirit of the sick man from the body, attracted or violently carried away by the spirit of the deceased relative; wherefore, when they become somewhat seriously sick they call the charm-healer that he may make the spirit return and give health to the body. These charm-healers, who are a pack of frauds and deceivers, cure in the following manner: Hardly has the healer entered the house of the sick person when they give him a fowl, which he kills in the name and honor of the old woman and wife of *Kadungayan*. He observes the state of the gall immediately, and after having looked very intently at the sick man, states his diagnosis in the following terms, or others somewhat similar: "The spirit of this sick person is in such or such a place, having gone to visit the spirit of his grandfather, wife, son, father, etc. In order to bring it about that it may return, there is need of so many hogs and a *carabao* or two, because in that way the soul will decide to return with great pleasure." The family then diligently prepares what has been indicated, procuring it by some means if they do not have it at hand. When the animals indicated have been killed, or while they are killing them, the healer calls the spirit with the point of a lance, in order that it may come down by the lance to the sick person. He invites it to come down, saying that there are so many hogs prepared, so many *carabaos,* and so much *vino;* sometimes he seizes a *gansa* and produces upon it a tremendous noise. I do not know why it does not break the head of the sick man. At other times he announces that he sees the spirit in such and such a place; that now it is coming down; that it now has left the spirit of its grandmother, and that now the sick man will get well. More, since the sick man dies or is cured according to the will of God, he often remains as sick as he was before, or becomes sicker; his friends then call the healer again, or summon some other healer with a greater reputation, if there is one, and the same performance is repeated. The healer says: "The soul of this person has gone away again; such and such a spirit detains it in such and such a place. It would seem that it has become accustomed to the other life, or wishes to live with its dead wife; there is need of more hogs and more buffaloes to make it come down." Finally the sick man dies, if it is the will of God, after those of his household have spent everything they have. This is the way of curing the sick, at whose expense the well eat and drink, the healer carrying away meat enough to last for many days in addition to his pay. As a result, the family often is completely ruined, the usurers getting away from them their estates or fields.

BELIEF OR FAITH OF THE IFUGAOS IN SIGNS.

I asked a certain Ifugao, who narrated to me with the utmost simplicity many of the things that I have just set forth, "Do you believe in these necessities which serve only to ruin you?" to which he replied: "I do not know, father, how much truth there may be in what other persons relate, because I have not seen it. I do believe what I saw very plainly on one occasion when I was sick for a whole year. It seemed that my spirit had gone up into heaven. There I ate and drank very well; I saw other Ifugaos who did the same, eating and drinking until they got drunk; their houses were like ours, and those who go about there without their heads on account of having had them cut off by the Mayoyaos, had others, although very small. When I awoke, after having dreamed all of these things, I hardly wished to eat, and desired to die."

Here is the principal reason for the persistency of the Ifugaos in their gross and stupid idolatrous practices. Dreams which they look upon as supernatural things, hold them all fascinated, especially the more simple of them. By this means, in which the devil may exercise so much influence, they are perfectly filled with the most stupid and absurd errors; they act upon impulse, and do or leave undone what vanity dictates or what is suggested by their insane imaginations, excited by the father of lies.

I ascribe the tenacity with which they adhere to their idolatrous practices to the fact that these things are quite in accord with their passions and their stomachs; and especially because they are confirmed as true and good by the apparent evidence, and the sort of vision, which more or less vivid dreams produce, in which they trust as facts revealed by hell or their hellish divinities. They dream what they do, and are going to do, and they believe what they dream. Thus it is that it is well-nigh useless to attempt to reason with the Ifugaos as to the evil course which they follow, and there is no other human means of making them abandon gradually their infidelity than by educating their children and their young. Thus, and in no other manner, speaking in general terms, have Christianity, the truth, and civilization been introduced among the other wild tribes that have been subdued.

DRUNKENNESS AMONG THE IFUGAOS.

Since they believe that the happiness and prosperity of their gods and ancestors consists in filling their bellies with the abstract and spiritual substance of the fowls, the hogs, and the old buffaloes whose flesh they themselves eat, and believing also that an important part of the happiness of the same beings consists in drinking to excess the same abstract principle of a *vino* which they call *bubud,* it is plain that they will be very diligent and fervid in drinking the concrete article until they get drunk, if possible, in honor of those whom they venerate as drunkards and gluttons of the first order. It is, therefore, easily seen that far from regarding drunkenness as a vice, they regard it, on the contrary, as a virtue, and an efficacious means of appeasing their pretended divinities, and in their vanity they regard it as a great honor to appear drunk even when they are not so. Thus, for example, to free themselves from the danger of being struck by lightning they have no better means than that of offering it the abstract *vino,* which they, of course, drink in its natural state; because they say that the lightning enjoys it greatly and after drinking *bubud* will not eat man.

This *vino,* or *bubud,* which is such a delicacy among the Ifugaos and their gods, they make in the following way: First they add to a small quantity of rice flour a very acrid and strong juice which they extract from a creeping plant. When this is made and dried in the sun, they have what may be called yeast, which they preserve very carefully. When they wish to make *vino* they cook a considerable quantity of rice with water alone, making the ordinary boiled rice. After drying this in the sun also, they mix it with some of the above-described yeast and introduce it into an earthen jar of suitable dimensions, which they cover perfectly tight, leaving it so eight or more days. Meanwhile it ferments, changing into a liquid of a very disagreeable taste, both acid and biting, which is called *bubud,* which serves them for food and drink; for, as they say, "it has food and it has drink." This liquid does not cause drunkenness, properly speaking, but rather a rabid fury which nothing will placate.[7] They make it and use it whenever they can, in all of their sacrifices, but especially and without fail in the following cases:

First, when they begin their work in the fields, at which time each one kills and eats as many hogs and *carabaos* as is possible for him, and as conforms to his estate.

Second, in the cases of severe infirmity and its cure, as has been explained.

Third, when they commit some murder, in which case they have great feasts and ceremonies for the crowning of the brave, killing and eating the best that they have or can borrow, offering all of this, together with the dances and the great drunkenness, to the soul of the murdered person, whose head, placed on the point of a pike, is the principal trophy and the central point of the shameless orgy. For this reason, even the relatives of the deceased person, who seek an inexorable vengeance, seem to respect these ferocious feasts, not exacting their due until the feasts have ceased.

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[7] My own observations do not confirm this statement as to the effect of *bubud.* (Dean C. Worcester.)

Fourth, before beginning the rice harvest, when they do the same as at the beginning of their labors in the fields.

Fifth, when the rice has been harvested and put into the granaries, in which case, on account of the satisfaction they find in entering upon a period of rest, and in order to obtain from their gods the preservation, and even the increase of what they have harvested, they leap and dance, eat and drink, which is a pleasure for them and a horror and alarm for anyone who is looking on.

Sixth, and last; in a sort of Lent, which they observe in honor of the god Baco, at which time their eating and their drunkenness reaches the highest grade, causing the origin of innumerable enmities, many deaths, and a thousand misfortunes, which occur for the most part between relatives and friends.

In all that I have narrated, I refer to the Ifugaos in the mountains. Those of the mission of Ibung, situated in the plain, do not do so much as the shadow of what the others do. They are gradually becoming accustomed to live submissively after the fashion of the Christians.

DIVINATIONS AND IDLE OBSERVANCES OF THE IFUGAOS.

In order to free themselves from the fears which beset them, they have a book which every Ifugao knows how to read. If at the first, second, or third reading, it does not appease the anger of their divinities they read it a fourth, fifth, or even more times, but it should be noted that each time it is read costs money, often equal to the value of a *carabao* or of an Ifugao soul; this book, and this reading, are the entrails of every fowl or animal that is eaten and the observation of the same. Their auguries are reduced ordinarily to the observation of the state of the gall of the animal which they kill. If it appears to them that the gall indicates good or fortunate results in the enterprises which they are about to undertake, they do not kill more fowls or hogs. But if the business turns out badly they repeat the killing of animals until they attain their end, although at the cost of their interests; for the fowls and the hogs which they are wont to borrow they have to pay their weight in gold according to the fearfully usurious rates which prevail among them.

Who can calculate the numberless times and occasions on which they believe it necessary to make use of this augury to free themselves from the thousand stupidities which cause them fear of death, of sickness, or of some other harm to their fortunes? Who could enumerate the fowls and other animals which they kill on account of their journeys to somewhat distant places, on which they fear the lances of their enemies; or by reason of their troubles, or those of their families; or when they are surprised in their labors in the fields by the song of some innocent bird, by the rainbow, or by other natural phenomena? For all of these imaginary evils they seek a remedy in what, on the other hand, causes them an interminable series of debts.

EXORBITANT USURY AMONG THE IFUGAOS.

It is an immemorable custom among the Ifugaos, received and practiced by all, that a pullet borrowed but not returned within a certain time, produces a hen or the equivalent of a hen; so it is that a hen must be given in payment for it if a sufficient time has passed since it was borrowed for it to grow into a hen. If a still longer time has passed, so that it is calculated that if it had lived it might have laid eggs and raised chickens, the price ascends to a hog of moderate size. If another year passes it is converted into a hog of the largest dimensions. And finally when the third year since the borrowing has passed, it makes itself into a *carabao*. It makes no difference whether it was a male or a female; in any event, it makes a hen a hog or a buffalo. In an analogous manner they return payment for other small things borrowed.

According to the Ifugao principle of interchangeable justice, the debts of parents descend to their sons, and if they have none, to their nearest relatives and their sons, although they did not enjoy any benefit from what was borrowed, nor inherit any estate from their elders. All of this is constantly carried out without anyone finding fault with anyone else. At the most, the only complaint is bad luck. They say it is a custom among them, and the fact that it is a custom is reason enough for its being venerated and carried out without complaint. Furthermore, everyone who borrows does the same, and it often happens that he who is the debtor to some, is the creditor of others.

The most unfortunate are the orphans whose parents were sick for a long time and who incurred heavy debts for the many pullets which they were obliged to kill.

This iniquity has an attendant circumstance which perennially augments it. The rich men, who are the nobles and the headmen, are always seeking opportunity to lend these things to everyone who asks. The poor are always ready to ask for loans, both because they can get them without difficulty, and because their creditors do not compel them to pay promptly, while the latter usurers, who do nothing but fill themselves with meat, get drunk, and pass an idle life, desire that they may delay to pay their debts. The whole load, therefore, goes to the orphans, who have to pass nearly all their lives sweating blood in the Christian towns to pay for the numberless buffaloes which are demanded of them, as well as the pullets and hogs which their parents spent on their stupid practices.

When I was at the mission of Quiangan a young fellow came to tell me that he was going down to the towns. "What do you go to seek there?" I asked. "I go to work in order to pay my debts, because if I do not do it I fear that they may kill me or sell me." "What debts are these?" "The debts that my father contracted when he was sick, for the fowls and the hogs which he spent in order to be cured." "It is a hard matter that you should have to pay for the caprice of your father." "It is our custom." "And how much do you have to pay?" "I do not know exactly; every one is after me and I reckon that it will be a matter of 40 *carabaos*." Many years ago this young fellow went down to the town. He has worked harder than a negro, he has paid many of his debts; at the same time incurring others as the result of following the customs and practices of his people. Although he should die an old man, he could never pay them all. So it is that the rich hold the poor enslaved.

In other districts further in the interior of the mountains, and extending to Japao,[8] in which, on account of the distance, the Ifugaos can not or dare not go to the towns and earn money for paying their debts, a few sweet potatoes, a quart of rice, or a fowl are frequently the cause of the selling of the debtor or his children as slaves. A hundred of them go to Isabela every year, and there they are bought or sold secretly for a hundred dollars, or a *carabao* or two, each. Therefore, the value of a few sweet potatoes, a handful of rice, or a pullet, ascends to a hundred dollars plus a *carabao*, and, what is more, to the value of a man. The usurers, who, in order to count a dozen have to make use of their fingers and, when the number passes ten, to sit down in order to count their toes, do not lose the count of the chickens which they lend, nor of a single sweet potato.

Ibung, January 31, 1879.

Fr. JUAN VILLAVERDE.

ADDENDUM.

Captain L. E. Case, of the Philippines Constabulary, who was stationed for a number of years at Banaue, furnishes the following interesting account of the story told him by an old Ifugao to explain the prevalence of the custom of head-hunting among his people:

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[8] Sapao.

WHY THE IFUGAOS TAKE THE HEADS OF THEIR ENEMIES.

When I was seeking to ascertain the reason for head-taking, the following was related to me by one of the aged inhabitants of Banaue. The tale is told throughout the Ifugao district of Nueva Vizcaya; also in Bontoc Province, except that different settlements almost all disagree as regards places and the duration of the flood.

"A long time ago all the country round about was level and had no woods growing on it, with the exception of two mountains; one in the north called *"Amuyao,"* and one in the southwest called *"Alauitan."*

"The people grew a small quantity of rice and caught fish in the river. They also hunted deer and wild hogs among the tall cogon grass on the banks of the river.

"One *chupa* of rice at that time was equal to two *gantas* at the present time, for a tablespoonful of rice after being cooked made a good meal for one person.

"Once when the wet season should have come it did not, and a dry season followed a dry season.

"The rice would not grow but burned up, and the cogon grass burned up; then the river began to get smaller and smaller until at last it sank out of sight in the ground. Then the people began to die and the *Apos* said: 'If we do not get water soon we shall all die. Let us dig down into the grave of the river, for the river is dead and has sunk into his grave, and perhaps we shall find the spirit of the river and it will save us from dying.'

"So they began to dig. At the end of three days the water rushed up, and it came so fast that some of them were drowned before they could get out of the way of it. Then there was plenty of water and the people were happy.

"They brought a dog and a wild cat and turned them loose in a vacant rice field to fight, that the people might be amused; and while the dog and cat were fighting, it became very dark and rain began to fall, and the people became afraid because it got dark while it was yet morning, and one old *Apo* began lamenting and saying 'the river God is angry with us for disturbing the grave of the river, now we shall all find our graves in the water;' and the water poured down from the sky faster than it came out of the river.

"Bugan and her brother Uigan had brought out their two dogs to take part in the fighting with the cat, but when it got so dark that they could not see they took hold of the dogs' tails thinking thereby to be guided back home, and thus they followed on after the dogs until they became exhausted and lay down and slept, and when they awoke they found they were on the top of Mount *Amuyao*. It was still raining and it rained for fifteen days. After the rain stopped the water began to go down, and as it slowly got lower, here and there they could see the tops of mountains sticking out; and after the water had all gone down they saw that in place of the level ground that they had known before the rain, all round about them were mountains with rivers running here and there.

"One day while Uigan slept Bugan set out to see if she could find some other people, for she thought that there must have been others who escaped up into the mountains; so she traveled till she came to Mount *Alauitan,* without finding anyone.

Uigan on awakening and finding his sister gone started out to look for her and trailed her with his dog. On coming near *Alauitan,* he saw a large smoke rising from the top of the mountains and concluded that there were some other people saved beside himself and his sister, but, on arriving where the fire was, he found only his sister.

"It was then for the first time that they realized that they were the only people left alive after the rain, so taking his sister with him Uigan returned to *Amuyao* where they lived on an open spot cleared by them on the top of the mountain.

"To this day nothing grows on this spot, and the print of Bugan's foot is still to be seen.

"In due course of time there were born to them five sons and four daughters, Balangao, Honanga, Banol and Etnig, each taking a sister for his wife.

"There being only four sisters and five brothers, Igon, the youngest of the brothers, had no one for his wife, and the other four brothers concluded that as Igon had no wife it would be better for them to kill him and thus possibly save themselves future trouble. So they killed Igon.

"Then Bugan and Uigan said, 'Now that you have killed Igon, you must kill some animals and have a feast to make peace with his spirit,' so the brothers caught a deer, but Uigan said, 'No, that did not cause you any sweat, your dog caught that. What you have for this feast must have cost you work.' So, leaving their dogs at home they went and caught deer and wild hogs while their wives prepared the rice and *bubud.*

"Then Uigan said, 'You must take the head of Igon and put it on a pole and you must dance around it that the *linaoua* (spirit) of Igon may be pleased.'

"After the feast was ended Uigan commanded that they boil the head of Igon till the flesh all came off the bones, and then fasten it up on the side of the house so that they might always be reminded that they had killed their brother.

"Finally the brothers began to get jealous of one another, and each one decided that he would like to have the heads of his other three brothers to fasten up on his house; but Uigan and Bugan, knowing how things stood, told them to separate, each man taking his wife and going to a new place and that then they should people the earth as it was before the rain.

"So Balangao took his wife and traveled to a place which was named after him, but is now known as Lepanto, Hananga went to what is now called Mayoyao, Banol went to what is now called Banaue, and Etnig[9] traveled to Ilocos; and the offspring of these four brothers multiplied until they peopled the whole of northern Luzon.

"Uigan, on parting from his four sons and daughters, told them that they must remember at all times, whether good or bad, the brother whom they had killed."

Thus it is that up to the present time the Ifugao custom of taking heads and having *cañaos* in commemoration of the head of Igon taken by their forefathers continues, and the word Bunijon, which is commonly supposed to be the name of their God, is simply a word meant to include the three names Uigan, Bugan and Igon to whom they make their *cañaos.*

On the top of Mount *Amuyao* where Bugan lived, no one can pass, as people going up there have never been heard from again; and on Mount *Alauitan* where Bugan made the fire, fire is seen up to the present time, but when one draws near it disappears.

The Ifugao has an idea that bad crops, sickness and the like are caused by the spirits of the departed. Tangaña, an Ifugao of Banaue, had a son who was sick and remained sick some weeks. He came and informed me that his father's head had been taken some years past by the people of Guinijon and that his death had never been avenged. Consequently, he was causing the boy to be sick as a sort of a reminder to the head of the family, so he requested that an expedition be made for the purpose of avenging his father's death. I suggested that probably the old man did not like the place where he was buried. Later on he took the body up and reburied it on a side hill behind his house. The sick boy improved somewhat, but still remained ill. The body was then taken up and with the usual *cañao* reburied beneath the house in a vault with the bodies of his ancestors. The boy recovered his health within a week and Tangana has decided that his father's spirit is satisfied.

I attended the burial of an old woman. It took place one evening just as the sun went down. A hole had been dug in the ground tapping a tunnel which ran to a vault under the house. Lighted torches were thrust into the tunnel after which the body, tied in a sitting posture and wrapped in a blanket, was carried in. On inquiry they told me that it was leaned up against the wall; then they all indulged in a good deal of shouting and informed me that they had told the old woman that they had used her well, given her a good *cañao,* kept a fire going constantly and done all that could be expected of them and asked her not to stay around but to go to the *rancherias* of their enemies.

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[9] The Tingians commonly call themselves "*Etnig.*" (Dean C. Worcester.)

When an Ifugao dies, all those in the immediate vicinity set up a shouting to scare the spirit away.

When an Ifugao's wife dies he lets his hair grow. Until he cuts his hair he can not take another wife, and before cutting his hair he must take part in an expedition during which some of the enemy are killed, or a house is burned at least. He then goes home and kills a hog at the same time getting his hair cut and having a *cañao*. He may then take another wife.

The custom of smoking people after death does not hold among the Ifugaos of Nueva Vizcaya. The fact that a small fire is kept burning in front of the corpse evidently gives rise to this theory. On asking Ifugaos why they kept this fire burning I have been told: "Yes, when she goes up where the rest of the dead Ifugaos are and draws near the fire to cook her rice, and some one pushes her away and says 'Get away from here, you have no fire,' then she can say, 'Yes, I have a fire; look down there and see; there is my fire!' "

The Ifugaos, in order to keep their dead a number of days, will take a body after it has been dead about three days, and, with a cloth or some fiber, rub and press the flesh, squeezing out the blood. They also resort to salting the body. I once heard two Ifugaos disputing as to which was the richer. One said to the other "Oh yes, you are rich, you are, but when your mother died you did not put any salt on her as I did when mine died."

These customs differ greatly in the different rancherias. Especially do those on the Alimit River and its tributaries differ from those on the Ibilao and its tributaries.

There is generally much speculation as to the difference between the Banaue, Silipan and Quiangan Ifugaos.

The people living on the Ibilao River from the Lagaue gap through Lingay, Sapao and on up to its headwaters near Polis Pass and up to the heads of all its tributaries have the same customs and speech as those of Quiangan, as also have the people of Madanum, Ilamut and Antipolo.

Traveling from Banaue direct to the rancherias near Payauan (Silipan Ifugaos) the dialect seems to be altogether different, as do the people; but if one starts from Banaue and follows down the Alimit River gradually, or branches off at Dukligan, and travels through the rancherias over the mountains to Payauan he will not be aware of any difference whatever.

Now while there is a difference between the Quiangan and other Ifugaos, it is not great enough to justify their being considered as distinct from one another. Differences also exist between all of the various groups of Silipan Ifugaos (Banaue, Ayangan, Alimit, Mayoyao and Ilap); the farther apart they live the greater the difference.

This would tend to show that the Igorots who inhabit the northern part of Nueva Vizcaya are the same people; that in entering the mountains a party of them passed up through the Lagaue gap, settling at Lagaue; from which place, as they increased in numbers, they spread out peopling the valley of the Ibilao River up to its source, as well as along the streams that empty into it above Lagaue. Another party traveled down the Ibilao River, spreading out in the valleys of the small streams among the mountains, following the Magat River as far as the mouth of the Alimit; then on as far as the junction of the Alimit and Mayoyao Rivers and ever farther up, peopling all the land drained by these streams.

L. E. Case.

ILLUSTRATIONS.

PLATE I.

FIG. 1. The distant high peak at the extreme right is Mount Amuyao. The double peak at the left is Mount Alauitan, according to the Ifugaos of Banaue, and the country to the east and north of that place. The Ifugaos of Sapao, Asin and the neighboring country maintain that the mountains shown in Plate I, fig. 3, is Alauitan. (Photo. by Martin.)

2. One of the numerous settlements which collectively form Quiangan. (Photo. by Martin.)

3. The highest peak of the Mount Polis Range, said by the Ifugaos of Sapao, Asin and vicinity, to be Alauitan. (Photo. by Martin.)

PLATE II.

The country of the Ifugaos. View looking east across Nueva Vizcaya from the top of Mount Polis. (Photo. by Worcester.)

PLATE III.

FIG. 1. A typical Ifugao house. Note the five human skulls at the left of the ladder. (Photo. by Martin.)

2. Part of an Ifugao house ornamented with human skulls, and with the skulls of *carabaos* which have been eaten at feasts. Banaue. (Photo. by Worcester.)

PLATE IV.

Ifugao rice terraces with stone retaining walls. Banaue. (Photo. by Worcester.)

PLATE V.

Ifugao rice terraces with stone retaining walls. (Photo. by Murphy.)

PLATE VI.

FIG. 1. A group of Ifugao men with wooden shovels. Banaue. (Photo. by Hamilton Wright.)

2. Ifugao men working with wooden shovels in their rice terraces. Quiangan. (Photo. by Worcester.)

PLATE VII.

FIG. 1. Ifugao blacksmiths. Sapao. (Photo. by Murphy.)

2. A *tagábi*, or carved seat with *anito* image in front. Quiangan. (Photo. by Martin.)

PLATE VIII.

FIG. 1. An Ifugao man and woman dancing. Quiangan. (Photo. by Martin.)

2. Ifugao lances and hats. Banaue. (Photo. by Worcester.)

PLATE IX.

FIG. 1. An Ifugao woman weaving. Quiangan. (Photo. by Martin.)
2. A stone "*pilapil*" or retaining wall showing projecting steps. The Ifugaos are particularly skillful in building these retaining walls of dry stone. (Photo. by Miller.)

PLATE X.

Wooden spoons. Also front and side views of an image of the goddess of plenty. Carved by Ifugaos of Banaue. Photos. by Worcester.)

PLATE XI.

Part of a circle of Ifugaos watching a dance. Quiangan. (Photo by Worcester.)

PLATE XII.

Ifugaos at Quiangan cutting down a *carabao* with their war knives. (Photo. by Worcester.)

PLATE XIII.

Ifugaos struggling for *carabao* meat. Magok. (Photo. by Martin.)

PLATE XIV.

A typical Ifugao man, showing war lance and shield; and a typical Ifugao woman, showing the dress of Ifugao women of the better class. Full length front views. (Photos. by Martin.)

PLATE XV.

FIG. 1. A typical Ifugao man, half length profile view, showing peculiar method of cutting hair which prevails generally among the Ifugaos. (Photo. by Martin.)
2. Young Ifugao woman of Quiangan, half front view, showing method of dressing the hair. (Photo. by Martin.)

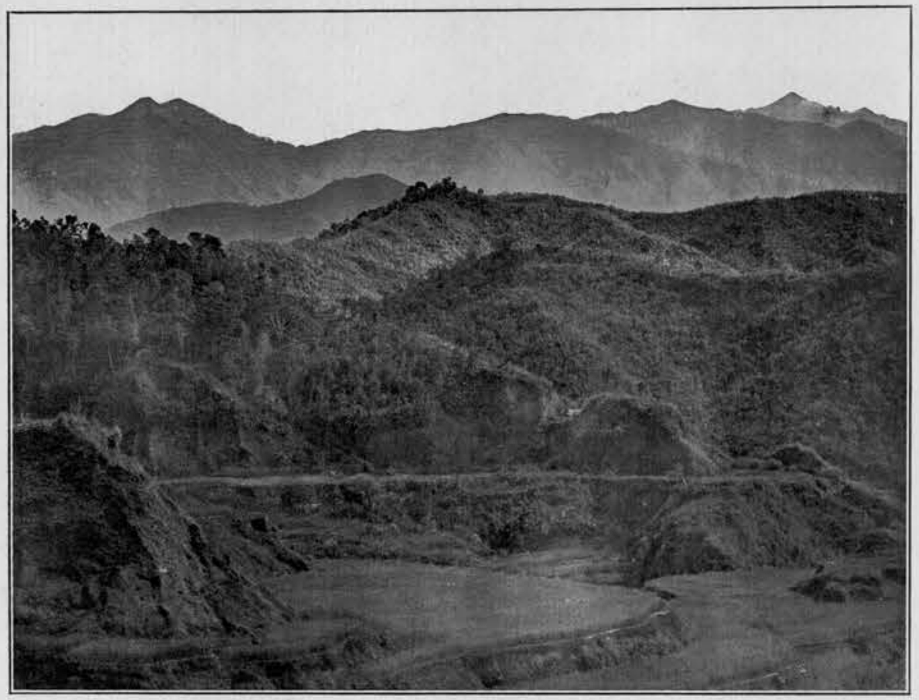


FIG. 1. MOUNT ALAUITAN TO THE LEFT, AND MOUNT AMUYAO TO THE RIGHT.

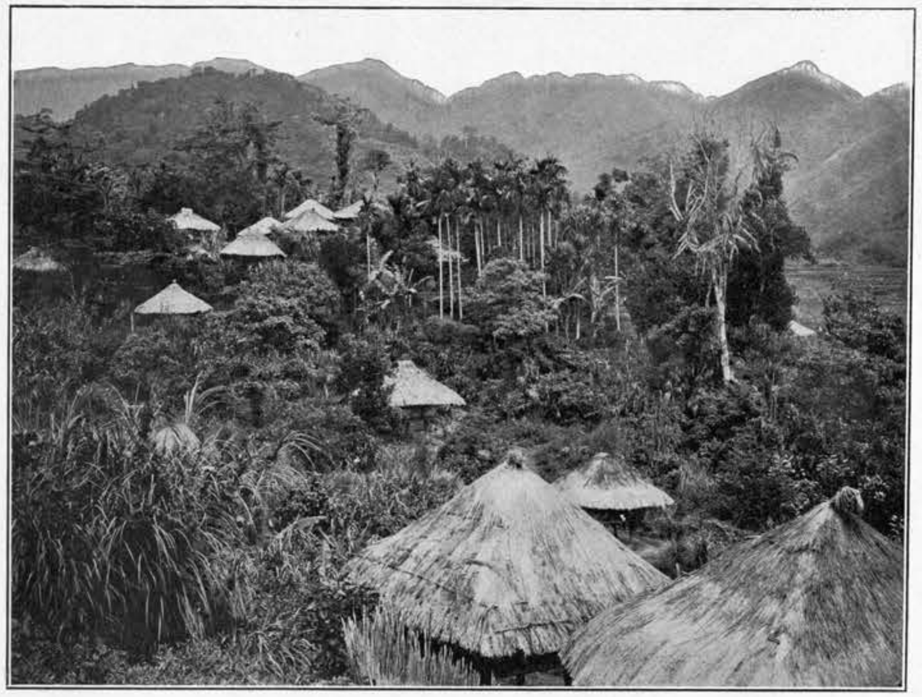


FIG. 2. IFUGAO SETTLEMENT, PART OF QUIANGAN.

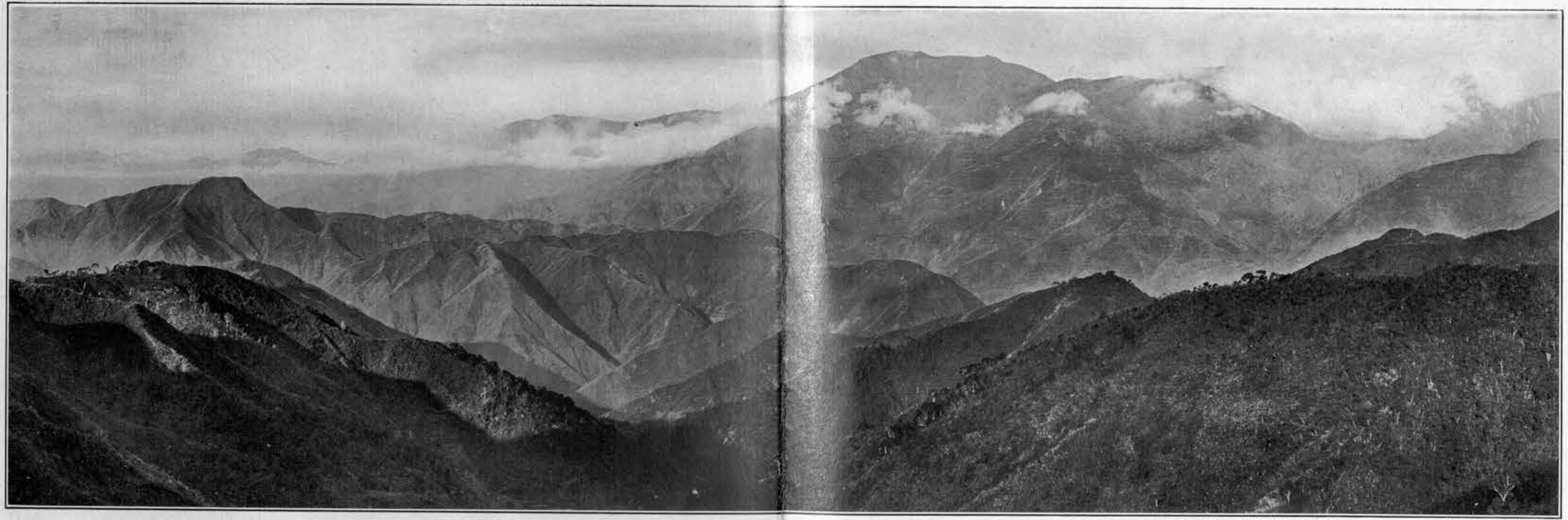
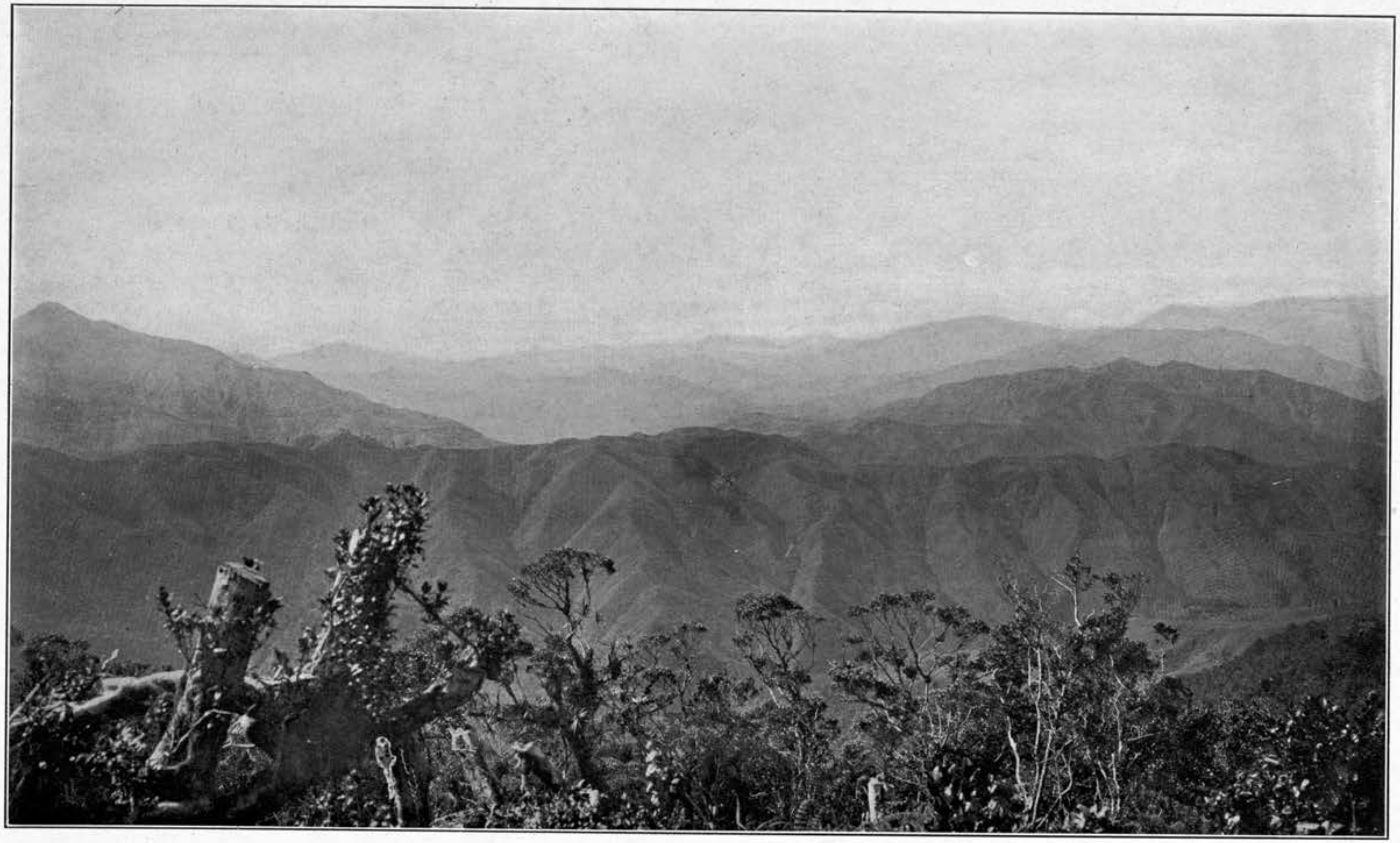


FIG. 3. THE HIGHEST PEAK OF THE MOUNT POLIS RANGE, CALLED ALAUITAN BY SOME IFUGAOS.

PLATE I.



COUNTRY OF THE IFUGAOS, LOOKING EAST FROM MOUNT POLIS.

PLATE II.

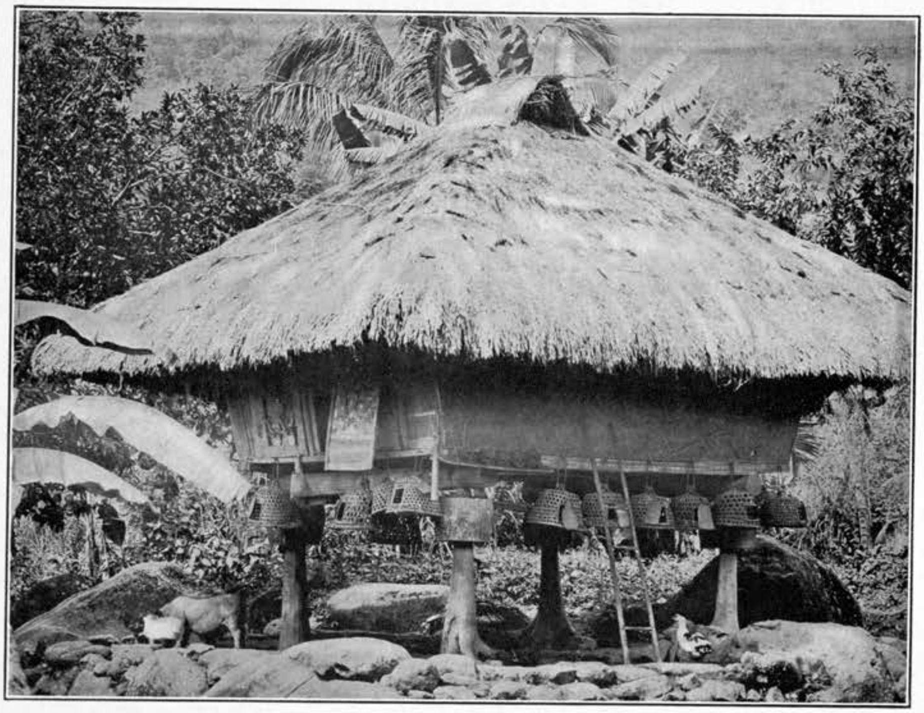


FIG. 1. TYPICAL IFUGAO HOUSE.

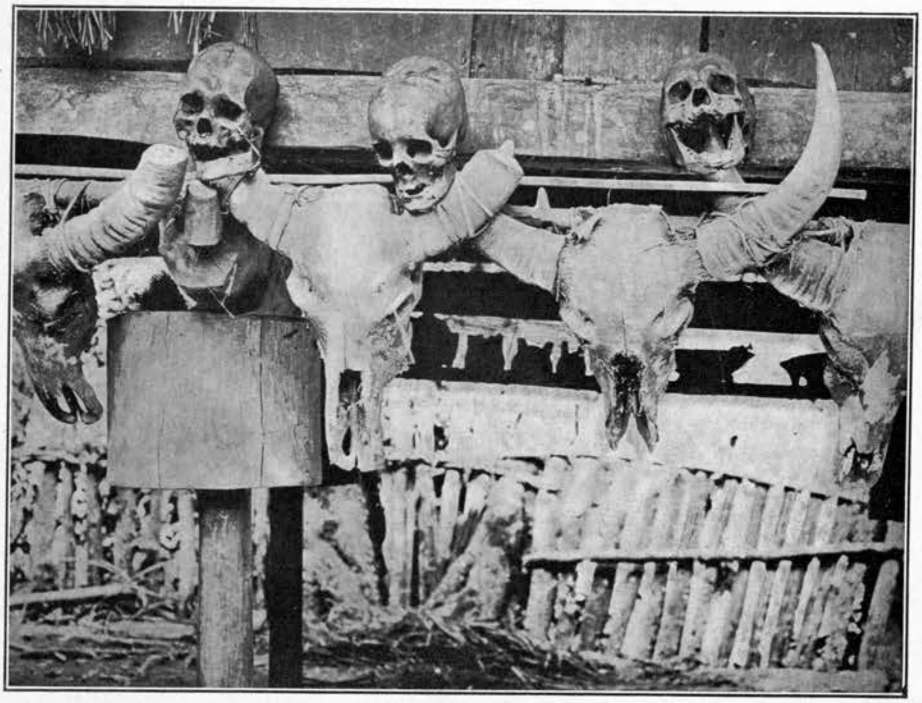


FIG. 2. PART OF AN IFUGAO HOUSE ORNAMENTED WITH SKULLS.

PLATE III.

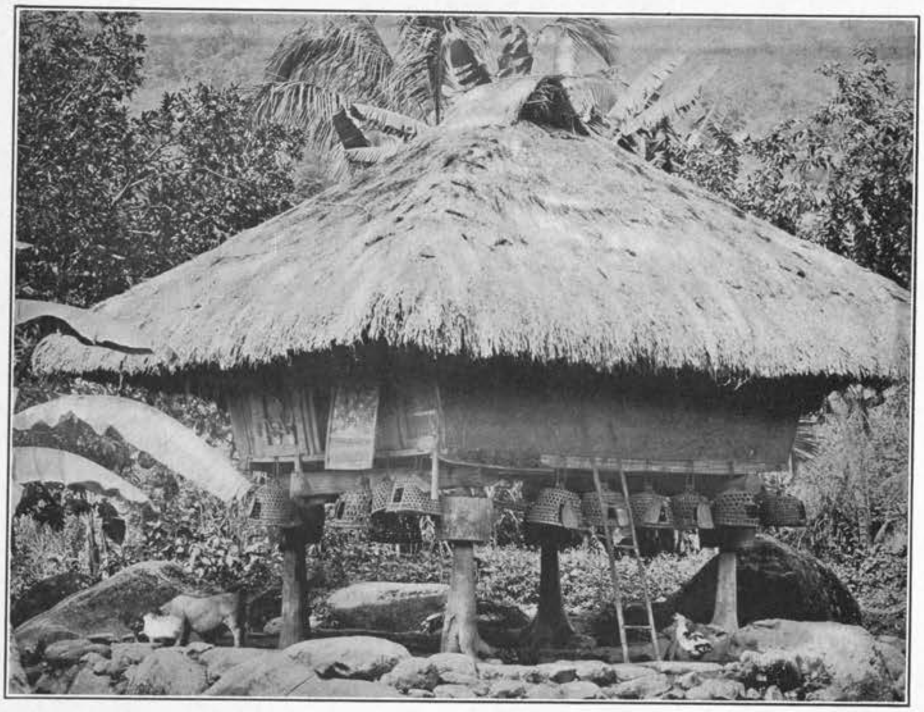


FIG. 1. TYPICAL IFUGAO HOUSE.

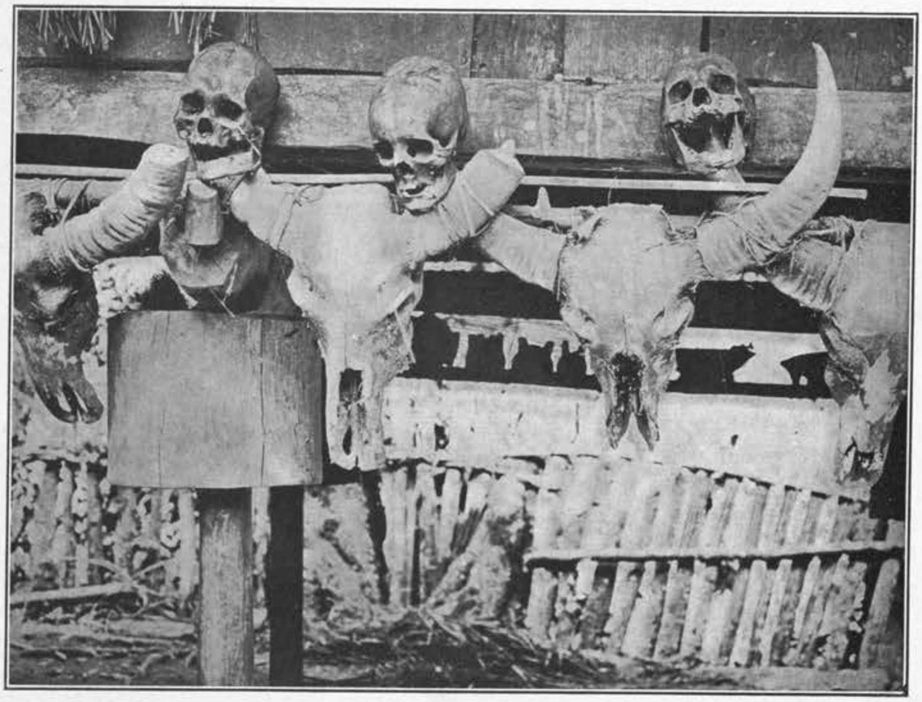
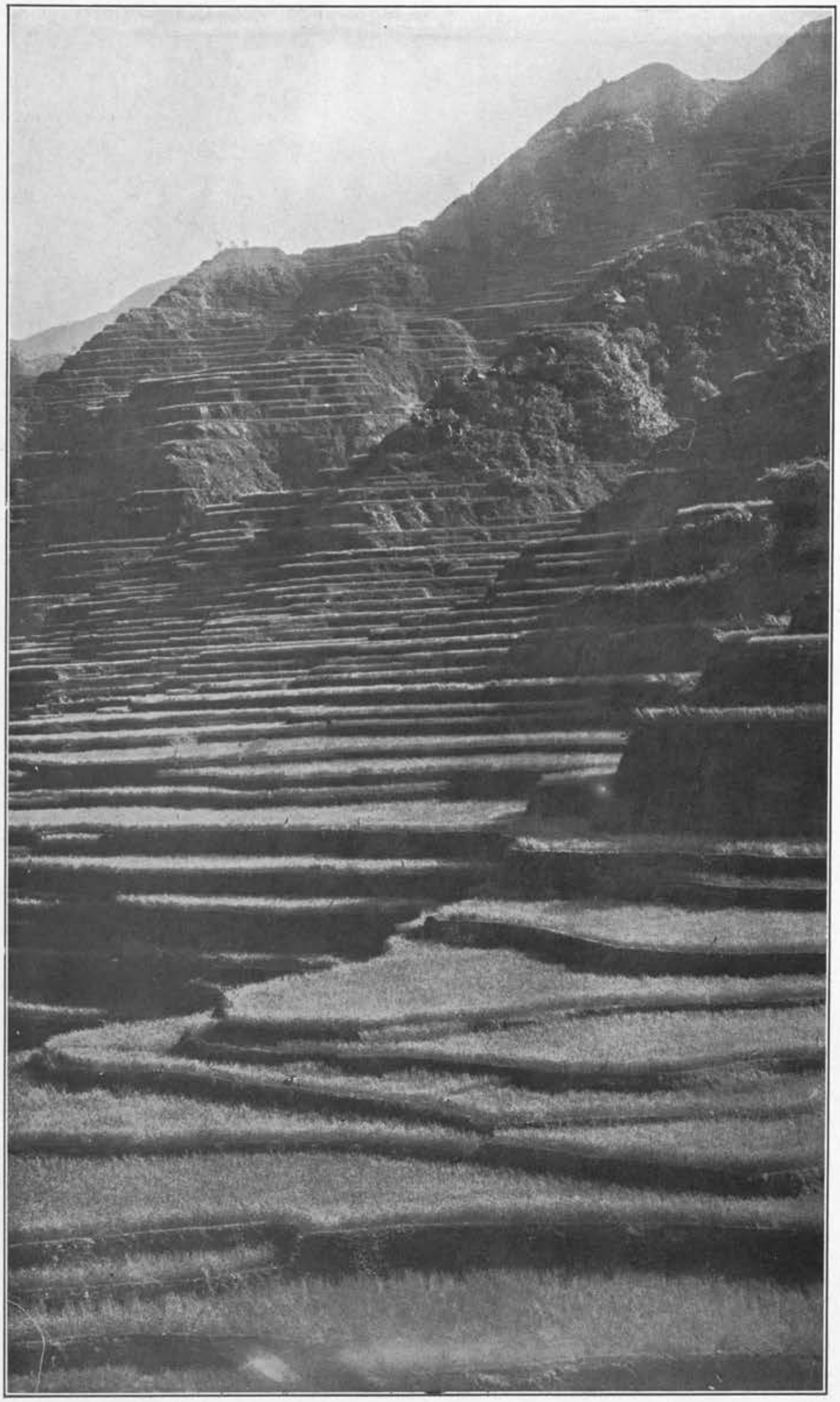


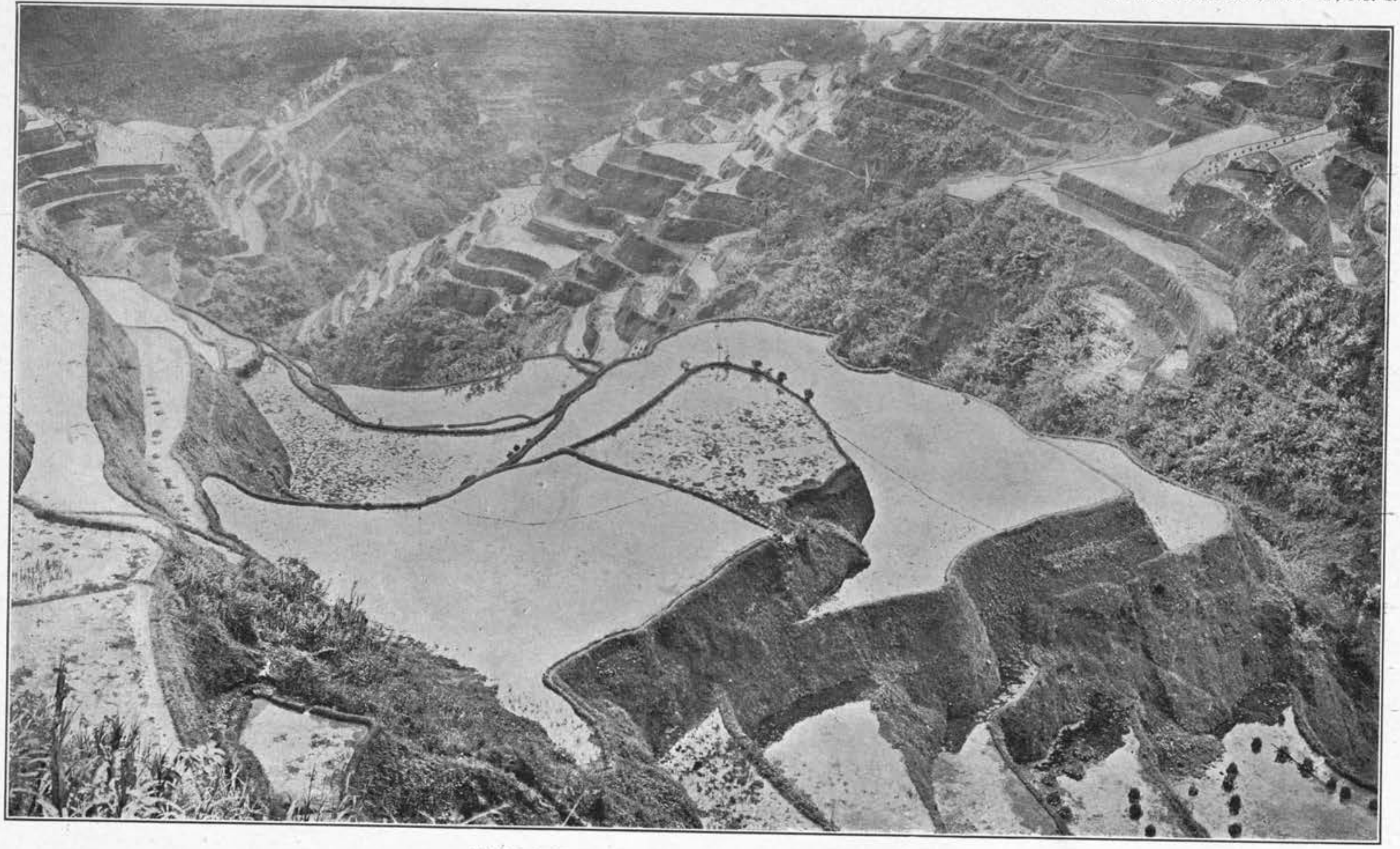
FIG. 2. PART OF AN IFUGAO HOUSE ORNAMENTED WITH SKULLS.

PLATE III.



IFUGAO RICE TERRACES WITH STONE RETAINING WALLS, BANAUE.

PLATE IV.



IFUGAO RICE TERRACES WITH STONE RETAINING WALLS.

PLATE V.

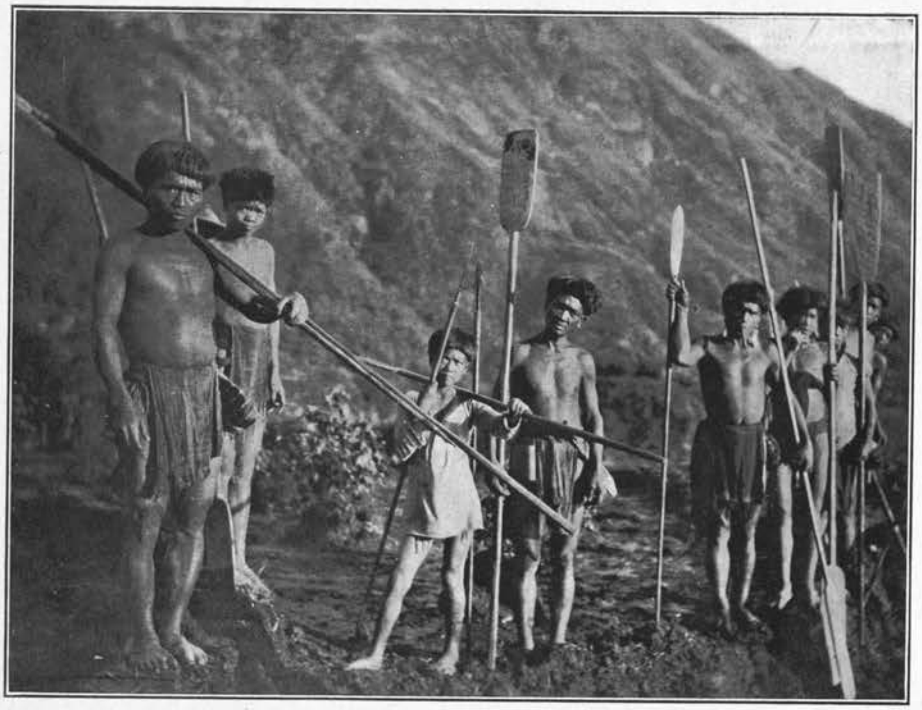


FIG. 1. IFUGAOS WITH WOODEN SHOVELS, BANAUE.

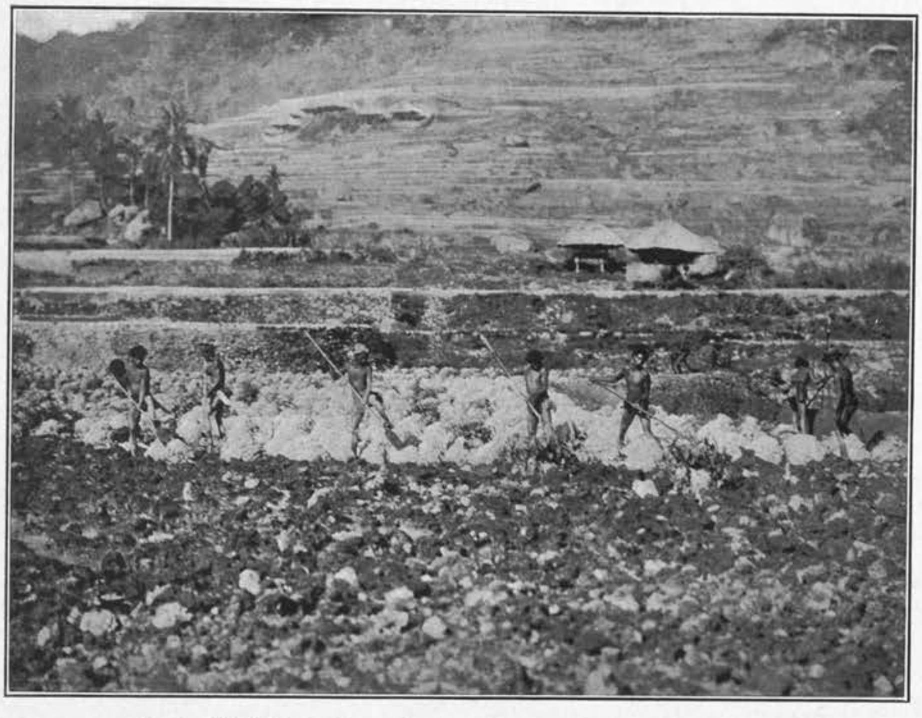


FIG. 2. IFUGAOS WORKING IN RICE TERRACES WITH WOODEN SHOVELS.

PLATE VI.

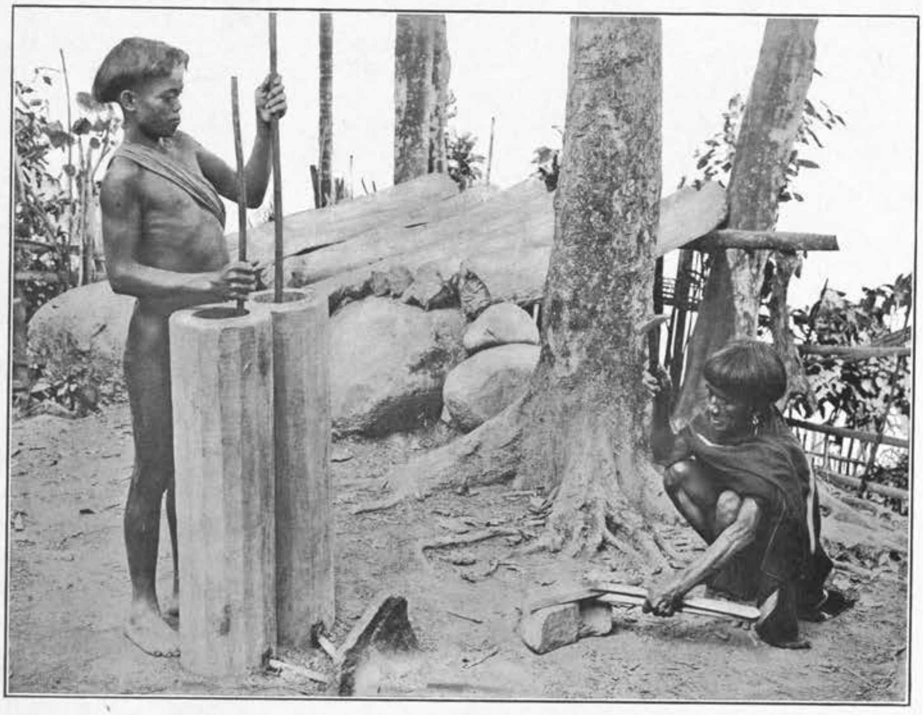


FIG. 1. IFUGAO BLACKSMITH'S SHOP, SAPAO.

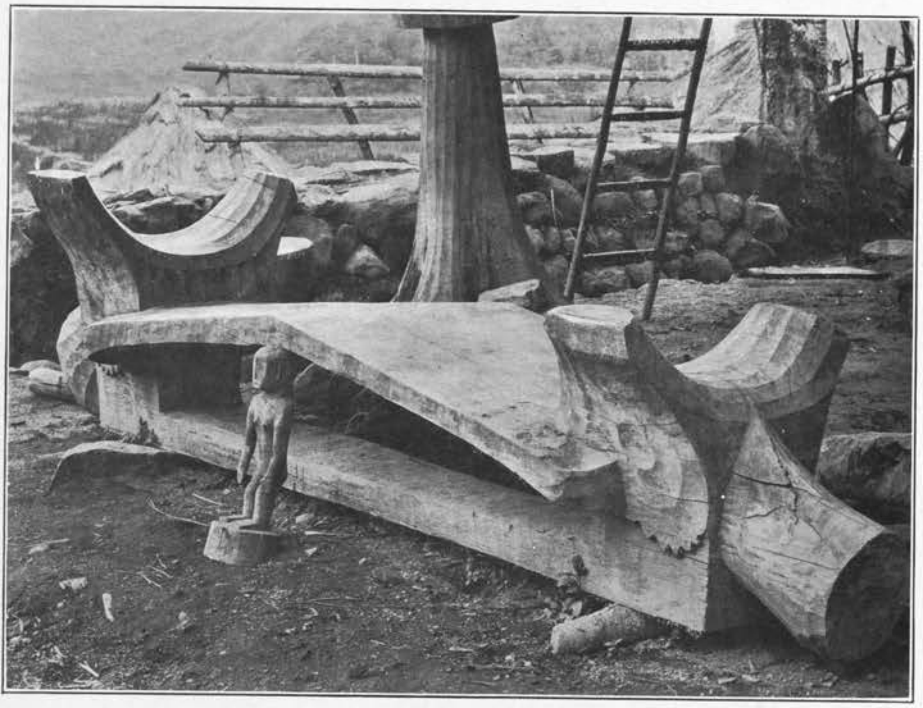


FIG. 2. TYPICAL IMAGE, AND "TAGÁBI" OR CARVED SEAT.

PLATE VII.

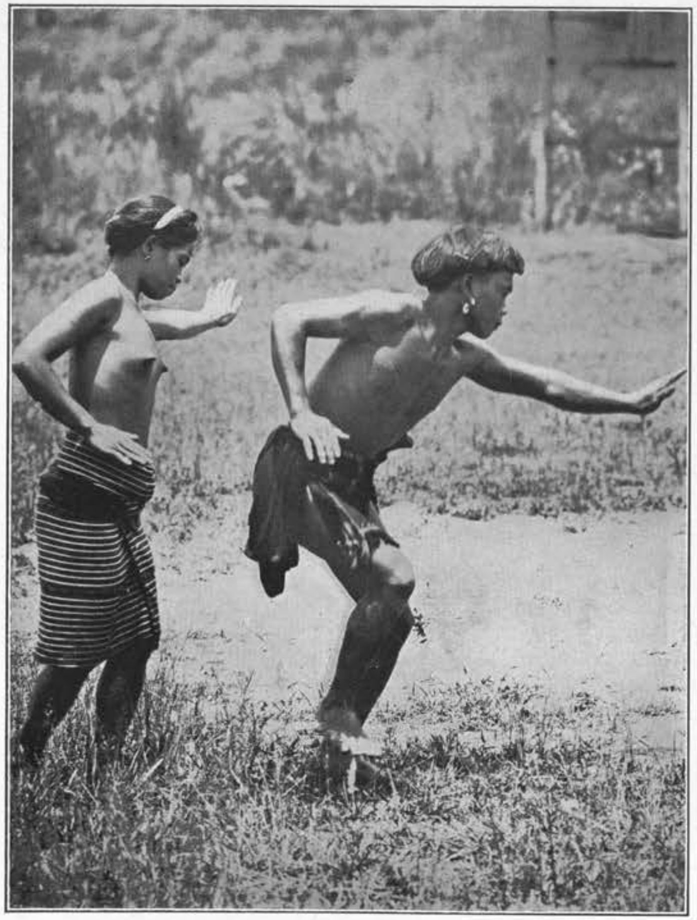


FIG. 1. IFUGAOS DANCING, QUIANGAN.

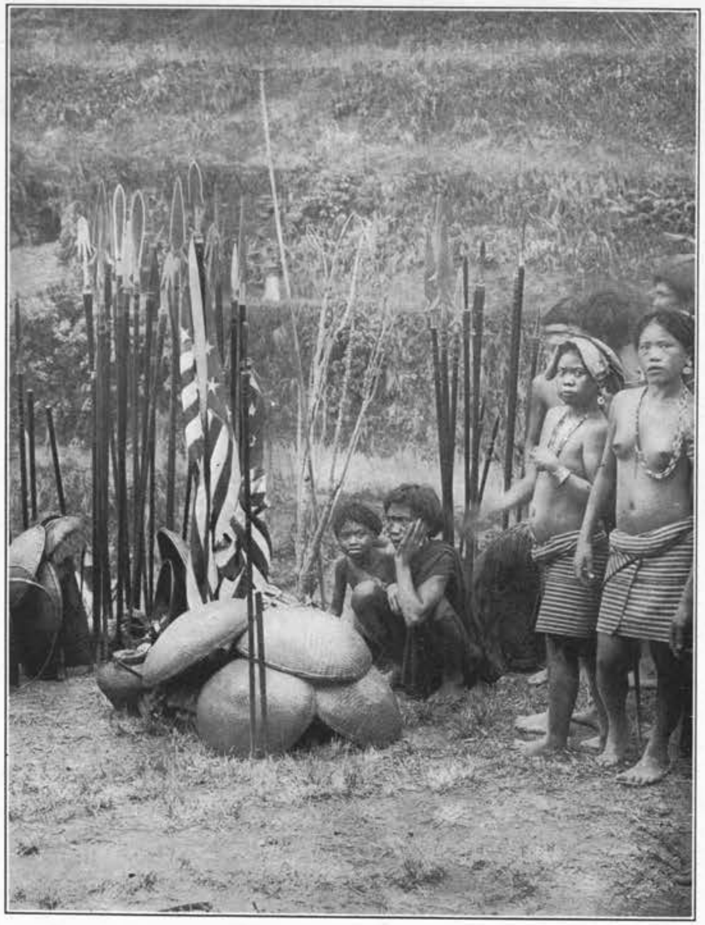


FIG. 2. IFUGAO LANCES AND HATS, BANAUE.

PLATE VIII.

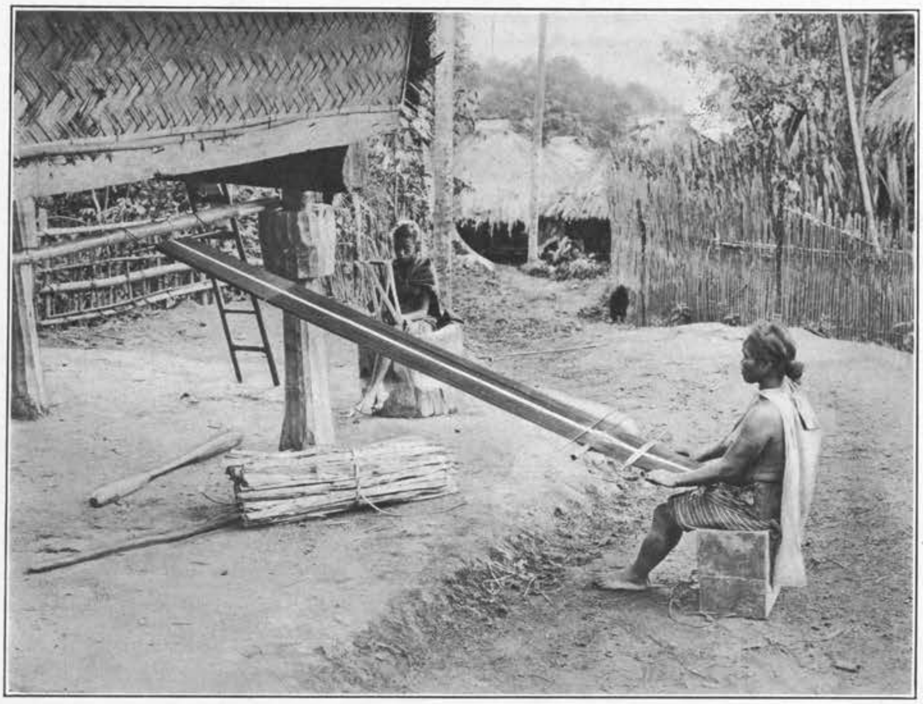


FIG. 1. IFUGAO WOMAN WEAVING.

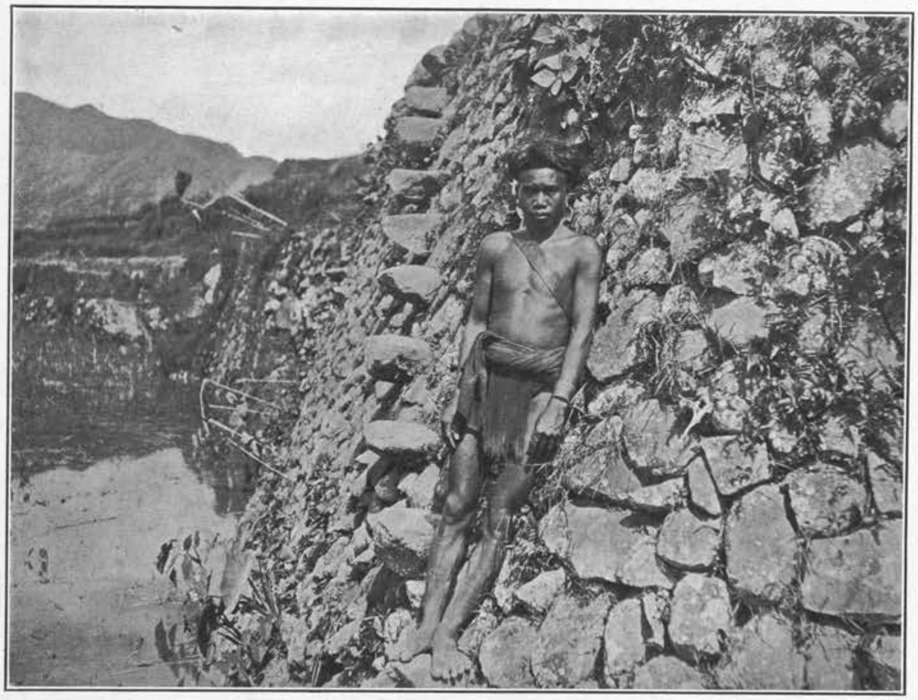
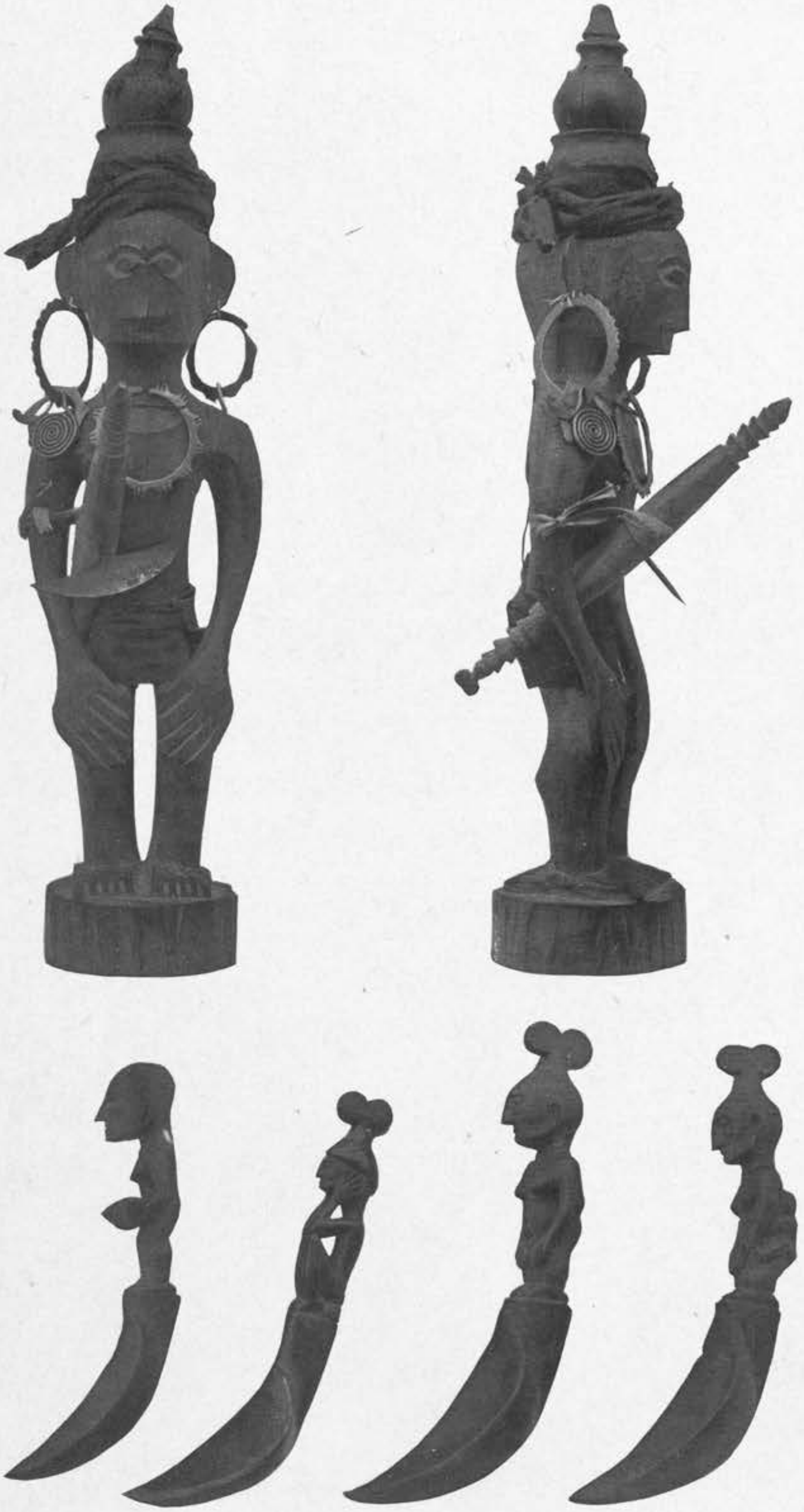


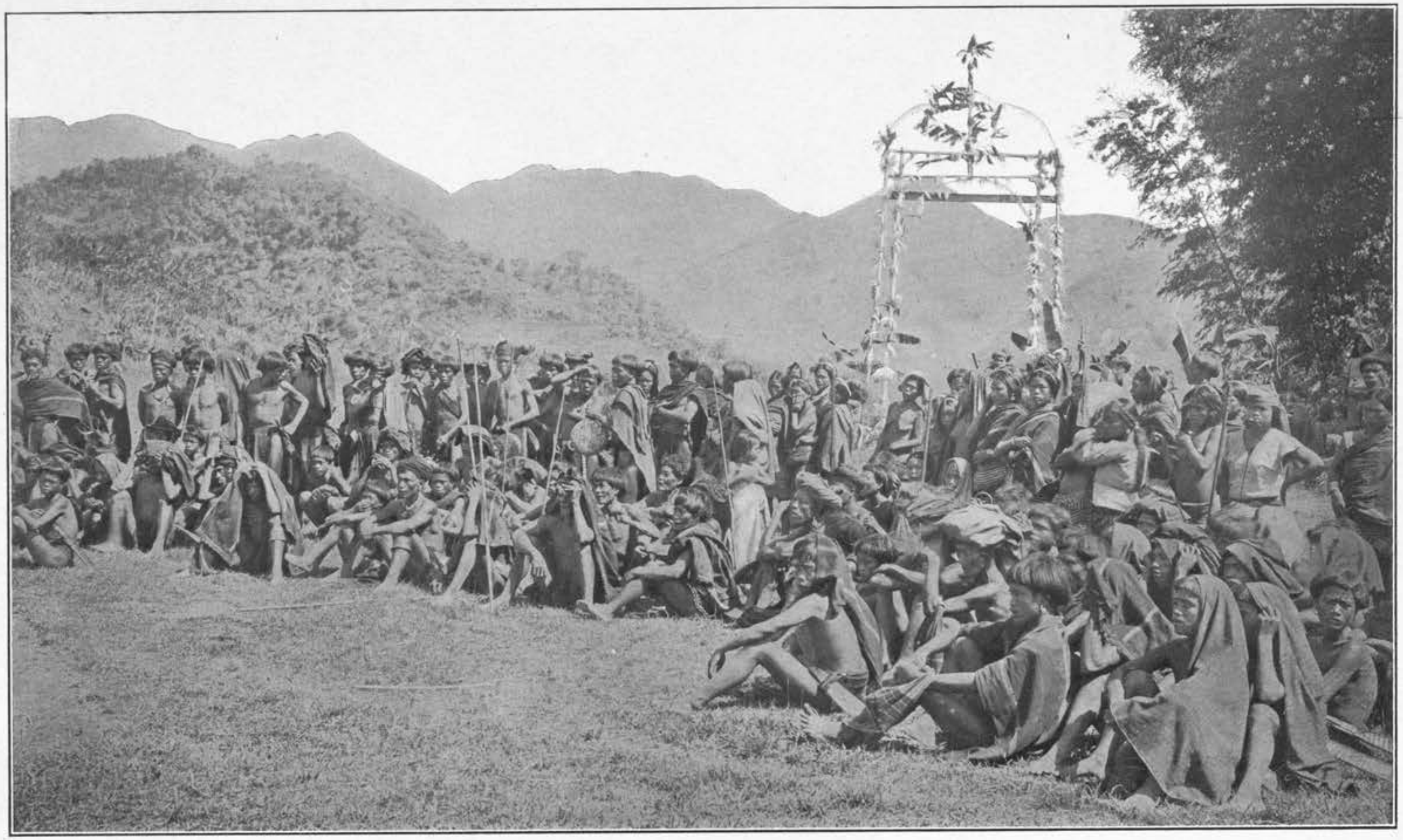
FIG. 2. STONE RETAINING WALL OR "PILAPIL" WITH PROJECTING STEPS.

PLATE IX.



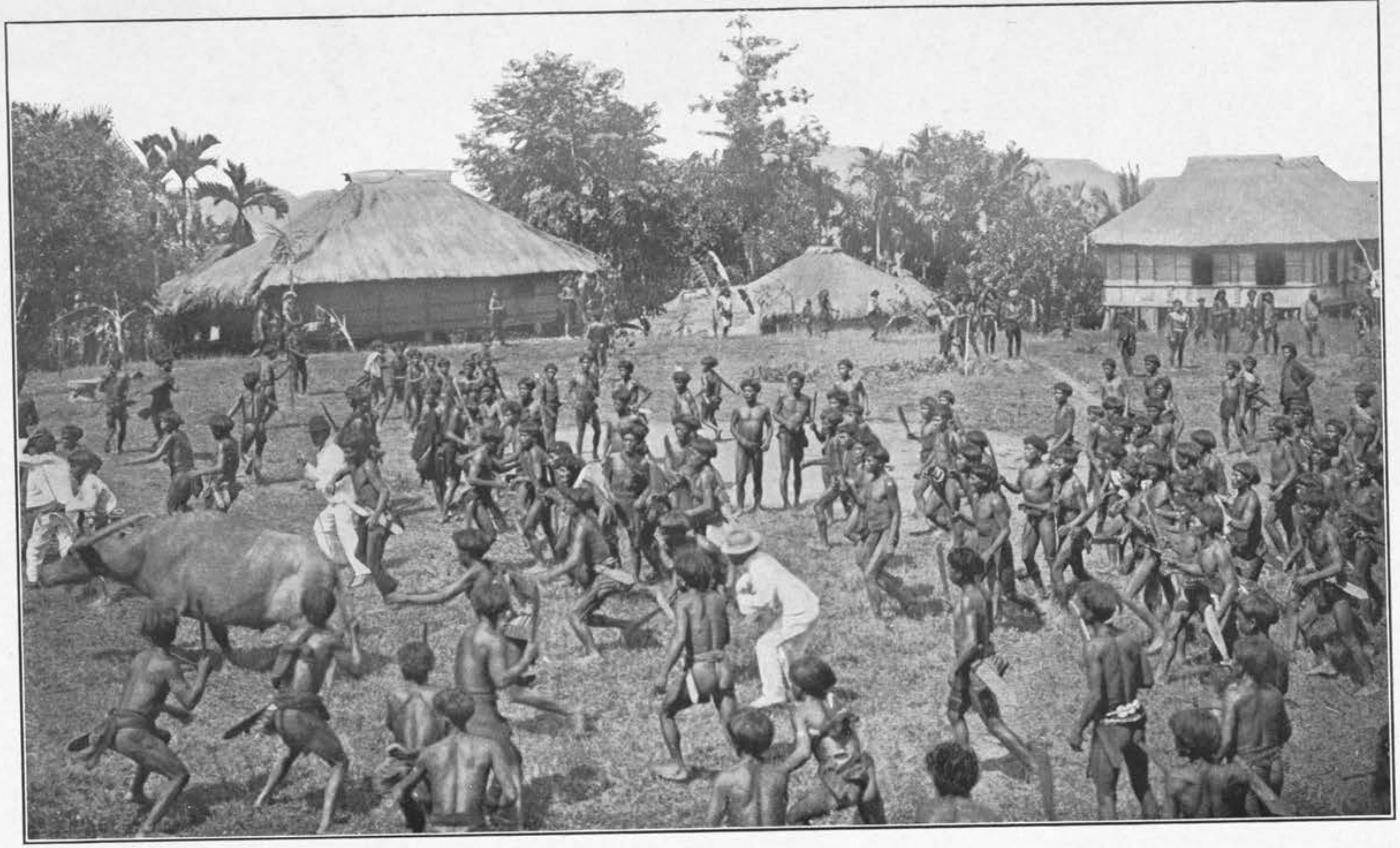
WOODEN SPOONS AND IMAGES.

PLATE X.



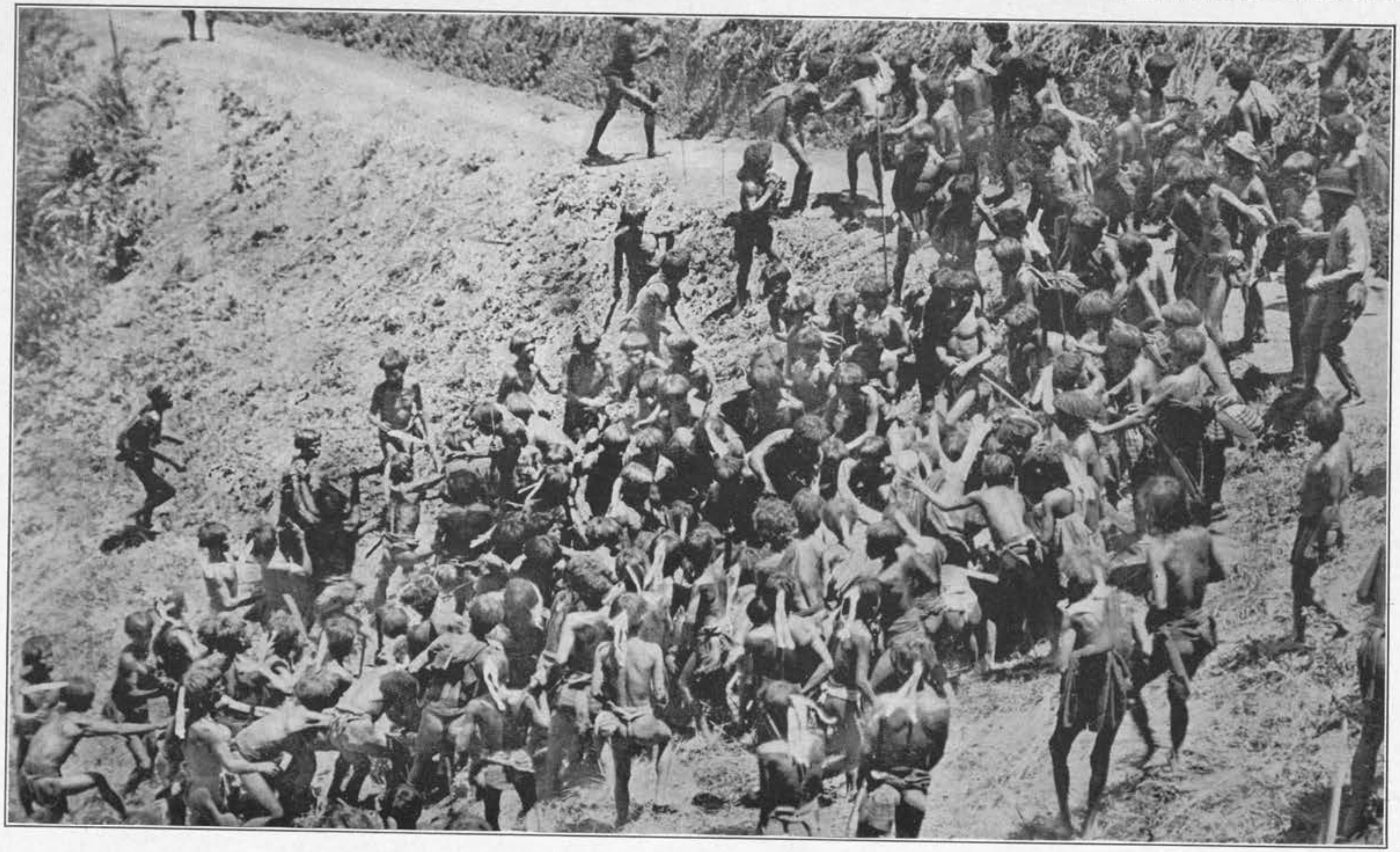
PART OF A CIRCLE OF IFUGAOS WATCHING A DANCE, QUIANGAN.

PLATE XI.



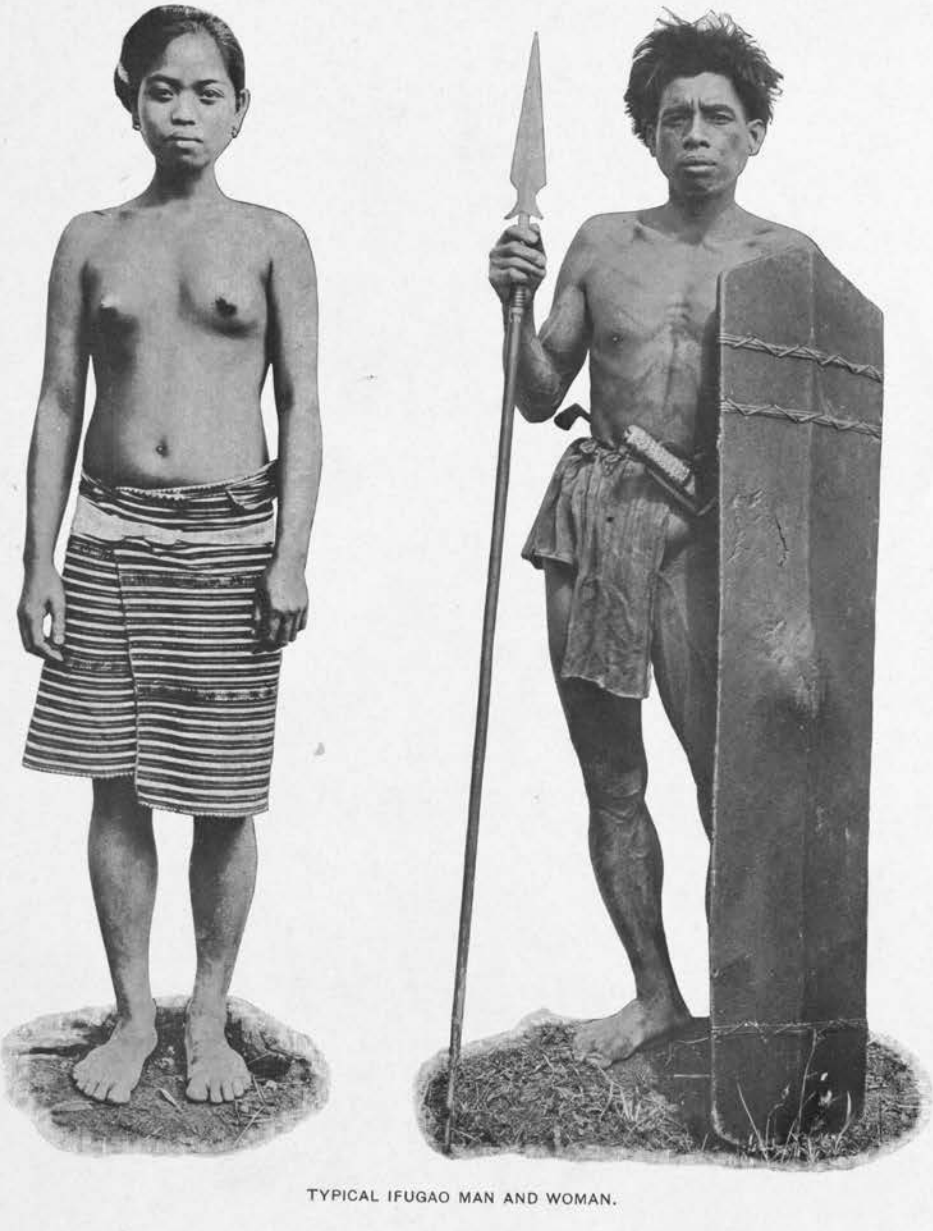
IFUGAOS CUTTING DOWN A CARABAO WITH WAR KNIVES.

PLATE XII.



IFUGAOS STRUGGLING FOR CARABAO MEAT.

PLATE XIII.



TYPICAL IFUGAO MAN AND WOMAN.

PLATE XIV.

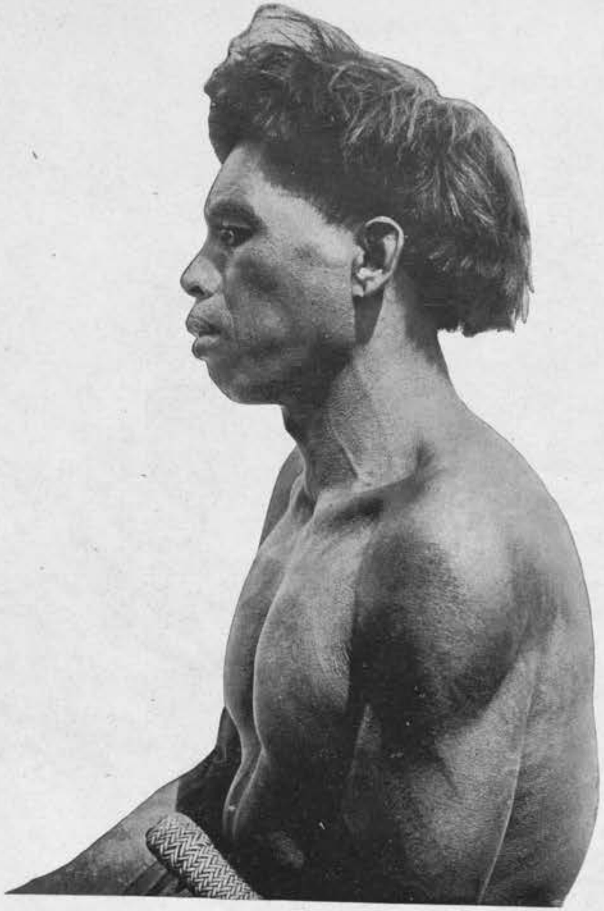


FIG. 1.

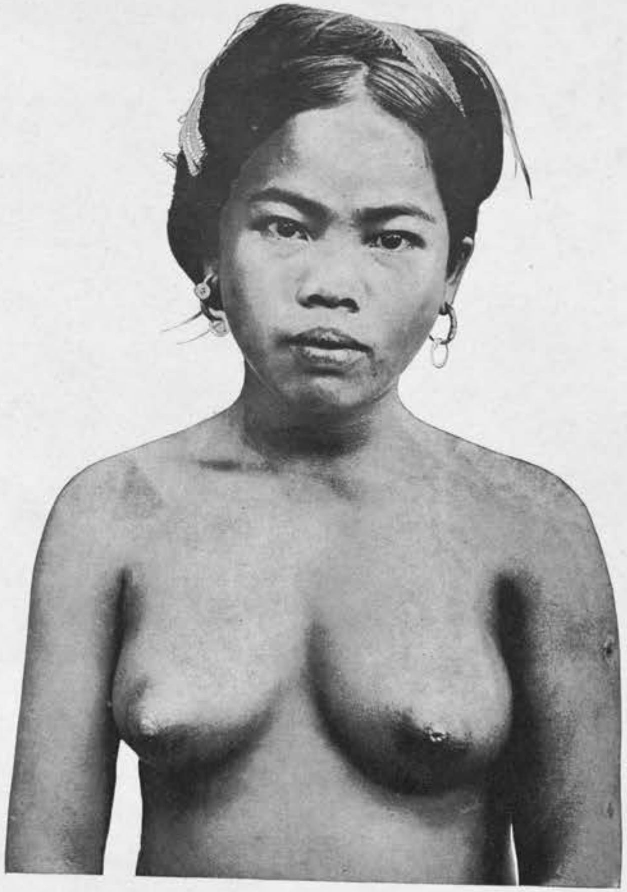


FIG. 2.

TYPICAL IFUGAO MAN AND WOMAN.

PLATE XV.

I. FILIPINO TYPES: MANILA STUDENTS. AN ATTEMPT TO CLASSIFY THE LITTORAL POPULATION OF LUZON AND ADJACENT ISLANDS.

By Robert Bennett Bean.

(From the Anatomical Laboratory, Philippine Medical School, Manila, P. I.)

INTRODUCTION.

Previous attempts have been made to classify the Filipino peoples, but each has included only an incomplete survey of the population. It is hoped that by making a consecutive series of observations such as I have carried on covering the mountain districts, the lowlands, and the littoral population, and by taking a random sample from all the culture levels, a more complete analysis of the physical types that make up the population of the Philippine Islands may be made, the origin of the people discovered, present tendencies of amalgamation revealed, and future conditions predicted. I shall classify types by physical characteristics, and not alone by locality. The littoral population of the Philippines is one of the most mixed in the world, and the physical types are complex, but it is by means of this very complexity that obscure problems of heredity may be made clear. The types of man that have crossed are so dissimilar that characters may be traced more readily than if they were similar.

Worcester(30) writes with full knowledge at first hand of the non-Christian tribes of northern Luzon, and gives a classification that is valuable ethnologically and sociologically. Virchow(28) and Blumentritt(7) have written of the Filipinos from a distant point of view, in an attempt to classify the people physically, and A. B. Meyer(18,19,20) measured the Igorots and Negritos. Montano(21) and Folkmar(12) measured the living Filipinos and classified them in local groups.

Montano classifies the Filipinos by physical characters and locality into Negrito, Indonesian, and Malay: the Negrito occupying the mountain wilds of the Islands, the Indonesian the fertile interior, especially of Luzon and Mindanao, and the Malay occupying the coast lands. It is to be supposed that the littoral population is at present largely Malay, to which have been added Chinese and European elements, and in which still remains a remnant of Negrito and Indonesian. At present, American and Negro mestizos are springing up in almost every part of the Islands, making a rich field for the racial anatomist.

The Malays, according to Montano, are divided into local groups, such as Bicols, Visayans, Tagalogs, Ilocanos, etc., and as this classification is followed by Folkmar and others, I shall compare their measurements with mine in similar groups, by means of tables, at the end of this paper. (Tables 2, 3 and 4.) Montano and Folkmar confined their observations to types selected to represent the locality from which they came, whereas I have measured students as I could get them in the Philippine Normal School and the School of Arts and Trades; both of these institutions are located in Manila but receive students from all parts of the Archipelago.[1] Montano's and Folkmar's measurements were of the common people whereas mine are of students, presumably from the better classes, and some of them are mestizos; therefore foreign blood and nurture must be considered in a comparison of the measurements.

Only individuals 18 years old and upwards are included in this study and only the anthropomorphic characters are utilized here, the remainder being reserved for future publication as a comparative study of school children. My thanks are due to Mr. Beattie, principal of the Philippine Normal School, for his kindly coöperation in the work. It was undertaken primarily as a study of school children, hoping that a knowledge of the teeth, the physical condition, and other data would be of assistance in guiding those who are interested in the fundamental principles of sociology.

CARDINAL ANTHROPOMORPHIC CHARACTERS.

DISCUSSION OF THE OBSERVATIONS ON 377 STUDENTS.

The average stature of 377 students is 163.3 centimeters, the cephalic index 82.1 centimeters, the nasal index 82.55 centimeters, the head length 18.4 centimeters, the head width 15.1 centimeters, the nose length 4.56 centimeters, and the nose width 3.76 centimeters. The nose is wider, the head longer, and the stature greater than that of the Bilibid prisoners measured by Folkmar(12). The stature is greater, the nose is narrower, and the head is wider than that of the Igorots(2). The stature and cephalic index are about the same as the middle European or Alpine stock as represented by the people of central France(10,24).

The mestizos are separated from the Filipinos and curves of stature, cephalic index, and nasal index are constructed to represent the individual in the mass and to show the mode and the extremes. (Charts I, II, and III.) The curves may be interpreted to indicate by their summits the types that have mingled in the formation of the present population of the Islands. The curves for cephalic index show the majority of mestizos to be below 80 and the majority of the Filipinos to be above that number. The curves for stature show great homogeneity, especially for the Filipinos, but less for the mestizos, which is due to greater diversity of type among the mestizos, and to the fact that stature is more plastic than head form, more subject to selection and environment. The curve for nasal index with its Gothic spires and cathedral form has summits that are more distinct than those of the cephalic index. The majority of the Filipinos have a high index (wide noses), and the majority of the mestizos have a lower index.

---

[1] The measurements of a few natives of the littoral population made at Baguio and elsewhere are included in this study. For details as to method of measurements, see "The Benguet Igorots," *This Journal, Sec. A* (1908), 3, No. 6, 413. The circumferences of the forehead, parietal, occipital, and frontal regions are all taken from the root of the zygomatic process and extend over the most prominent part of each region, that of the forehead passing above the brow ridges.

Recent observations in the study of heredity indicate that, in some cases at least, heredity is neither exclusively alternate (Mendelian) nor exclusively blended, but may be neither(9) or both(2,16). In any study of heredity, at least two kinds of variation must be considered: The variation due to environment, and that due to crossing opposite extremes of the same character such as black and white color. When these two varieties of variation do not overlap there is no confusion, but when they do, endless confusion may result. With this in mind, we may consider the physical characteristics of the Filipinos in the light of the recent work of Spillman(27). Schull, in hybridizing corn, "looks upon a cornfield as simply a heterogeneous collection of elementary species and hybrids between them," and Spillman accounts for these elementary species on the "old Darwinian idea of gradual evolution" by a simple scheme shown by I, II, and III:

I.

1	2	3	4	5	6	7	8	9	10
A^1	A^2	A^3	A^4	A^5	A^6	A^7	A^8	A^9	A^{10}
B^1	B^2	B^3	B^4	B^5	B^6	B^7	B^8	B^9	B^{10}
C^1	C^2	C^3	C^4	C^5	C^6	C^7	C^8	C^9	C^{10}

II.

$$\begin{array}{ccccc cccccccc}
 & & & & & (1) & (2) & (3) & (4) & (5) & (6) & (7) & (8) \\
A^1 & & A^5 & & & A^1 & A^1 & A^1 & A^1 & A^5 & A^5 & A^5 & A^5 \\
B^3 & + & B^8 & = & & B^3 & B^3 & B^8 & B^8 & B^3 & B^3 & B^8 & B^8 \\
C^2 & & C^6 & & & C^2 & C^6 & C^2 & C^6 & C^2 & C^6 & C^2 & C^6
\end{array}$$

III.

$$(1)+(1)=A^1 \quad A^1 \quad B^3 \quad B^3 \quad C^2 \quad C^2$$
$$(2)+(2)=A^1 \quad A^1 \quad B^3 \quad B^3 \quad C^6 \quad C^6$$
$$(3)+(3)=A^1 \quad A^1 \quad B^8 \quad B^8 \quad C^2 \quad C^2$$
$$(4)+(4)=A^1 \quad A^1 \quad B^8 \quad B^8 \quad C^6 \quad C^6$$
$$(5)+(5)=A^5 \quad A^5 \quad B^3 \quad B^3 \quad C^2 \quad C^2$$
$$(6)+(6)=A^5 \quad A^5 \quad B^3 \quad B^3 \quad C^6 \quad C^6$$
$$(7)+(7)=A^5 \quad A^5 \quad B^8 \quad B^8 \quad C^2 \quad C^2$$
$$(8)+(8)=A^5 \quad A^5 \quad B^8 \quad B^8 \quad C^6 \quad C^6$$

All types in III are derived from two types or elementary species, A^1 B^3 C^2 and A^5 B^8 C^6, A, B, and C being separable unit characters that obey Mendel's laws in cross mating.

Let A represent a Mendelian character that is variable and the differences of which are hereditary. Let B and C represent similar characters. The exponents represent the degree of difference between the characters, any two adjacent ones being so slightly different from each other as to appear to be exactly alike, but the difference between alternates is sufficient to be recognized and those that are far apart, as A^1 and A^{10}, are extremely different. Some of the intermediates may have disappeared leaving gaps not bridged over by living forms. The differences may have accumulated gradually throughout the time of the evolution of the structure and each one of the series now existing is fixed within the limits of environmental variation.

In order to illustrate the application of this scheme to the Filipinos under consideration, suppose that the three characters, stature, cephalic index, and nasal index are represented by A, B, and C, respectively. Let A^1 be a stature of 145 centimeters, and A^{10} a stature of 190 centimeters, with the other powers of A equivalent to the intervening statures at intervals of 5 centimeters for each power. Let B^1 represent a cephalic index of 72.5 and B^{10} one of 95.0, and C^1 represent a nasal index of 55 and C^{10} one of 100 with intervening indices accordingly, represented by the intervening powers of B and C. It will be seen that the exponents represent fairly well the summits of the curves of stature, cephalic index, and nasal index, therefore it may be inferred that the choice of values represented by the exponents is good, because they are actual points about which the characters fluctuate presumably by reason of enviroment. A hypothetical individual in which the gametic constitution is A^1 A^5 B^3 B^8 C^2 C^6, (the result of the marriage of two individuals with a gametic constitution of $2A^1$ B^3 C^2 and $2A^5$ B^8 C^6, respectively) when married to an individual of like gametic constitution, has the possibility of producing eight types that breed true and may be called elementary species (II and III). What really takes place among men remains to be determined, but if Mendelian characters in man follow the same course that they do among animals and plants in cross breeding, the above possibility becomes a strong probability.

We may now proceed to find what combinations of stature, cephalic index, and nasal index are found among the 377 Filipinos under consideration, and in this way select types that represent more or less homogeneous entities from which inferences may be drawn in confirmation of, or opposition to, Spillman's ideas regarding elementary species, especially in reference to man. These inferences can be firmly established only by measuring three or more generations in many families.

TYPES—INDIVIDUAL CHARACTERS.

The cephalic index is selected as the basis for the classification of types by individual characteristics, the nasal index is correlated with this and the stature is subordinated to the two in the following manner:

The group of cephalic indices as denoted by the curve (Chart II) at 74 to 78, 79 to 81, 82 to 84, 85 to 89, and 90 to 100, are segregated. It is found that the group at 74 to 78 may be subdivided by the nasal index into wide and narrow nosed types, and that the wide nosed type has a smaller stature than the narrow nosed type. The latter will be designated as modified Iberian because many mestizos are in the group, and the characteristics are similar to the Iberian type of Europe(10,25,26). The former will be designated as Australoid because it resembles a type similar to the Australian found among the Igorots(2). To this group also belong those individuals with cephalic index less than 83 and nasal index more than 12 above or below it.

The group 90 to 100 may also be subdivided by the nasal index into wide and narrow nosed types, and each of these may be divided into tall and small stature, the tall being largely mestizo and the small largely Filipino. The small are designated as Primitive, Modified Primitive, and Modified Alpine, the tall as Modified B. B. B. and Modified Adriatic. To this group also belong those individuals with cephalic index 83 and over and nasal index more than 12 greater or 12 less than the cephalic index.

The remainder with cephalic indices from 79 to 89 may be divided into three groups with mean cephalic indices of 80, 83, and 86 respectively and the nasal index of any individual less than 12 points above or below the cephalic index. The three groups are united to represent the fusing product of all types, or the average Filipino of the present, because of the homogeneity of the individuals and the large number in these groups.

MODIFIED IBERIAN TYPE.

There are 25 students of this type, of whom 16 are mestizos, and they come from the Provinces of Batangas, Bulacan, Rizal, Cavite, Mindoro, Zambales, Ilocos Norte, Pangasinan, Pampanga, Laguna, and the city of Manila. They are differentiated from other students primarily by stature, cephalic index, and nasal index, but a list of characteristics is presented that may also show differences. (Table I.)

This is one of the most distinct types and corresponds to the Mediterranean Race of Sergi(26), therefore it is taken as a standard with which to compare the remaining types. It is unlike the prehistoric Cro-Magnon of Europe(8) because of its smaller size and harmonic face, but the large occipital region and the relatively large face compared with the other types may indicate Cro-Magnon affinities. The Iberian and Cro-Magnon of Europe are related types, but the evidence here is very slight in confirmation of this relationship.

The stature is 1 centimeter more than that for the whole number of students, and the cephalic index and nasal index are each about 10 less. The morphologic face index is greater than that of the Igorots by 7, and the physiognomic face index is less by 2. The distance from chin to nasion is 8 millimeters more than for the Igorots, the distance from chin to hair line is 4 millimeters more, and the width of the face is 2 millimeters less. The head length is 4 millimeters more than for the Igorots, the head width is 1 millitemer less and the head height is 1 millimeter more. The average age is 7 years less than that of the Igorots.

In brief, this type is of medium height, with narrow head, nose, and face. The head and face are small and the individuals are thin. They are young and have bad teeth. Only one has hair that is not straight, and all have coarse, black hair except one that has fine brown hair.

AUSTRALOID TYPE.

Thirty students are of this type, and only 7 are mestizos. They are differentiated from other students in the same way as the Iberian type, and all the other types are differentiated in the same manner. The stature is below the medium height, the head is narrow, the nose and face are wide. Only one has wavy hair, the others have straight. The individuals are all young and thin. They come from Laguna, Samar, Bulacan, Rizal, Leyte, Pampanga, Albay, Cavite, Tayabas, and the city of Manila.

The characteristics of this type may be emphasized by contrast with the Iberian which it resembles in head shape and stature, although it is not quite so tall and dolichocephalic. (Table 1.) The nasal index of the Australoid is almost 20 higher than that of the Iberian, the morphologic face index is 5.3 higher, and the number of decayed teeth is 20 per cent less than with the Iberian type, and there are twice the number of individuals who have no decayed teeth; in other characteristics the two resemble each other closely.

Were it not that a type almost exactly the same as the Australoid was found among the Igorots and in about the same proportion to the whole number examined, it would seem that this is the result of the crossed Iberian and Primitive type of the Spanish and Filipino people, respectively, but among the Igorots there are no recent Iberians nor is there evidence of any that have recently come into contact with the Igorots. Therefore, I believe as stated in my recent work on the Igorots(2), that this type forms one of the primitive elements of the Filipinos. A comparison of the students of this type with the Igorots of the same type and with the Iberian as given in the following table may be of interest:

	Cephalic index.	Nasal index.	Stature.
Igorot	75.1	97.7	146.6
Student	76.8	92.7	161.0
Iberian	75.2	73.9	164.3

The stature of the Igorot is less than that of the student, but the cephalic index and nasal index are almost the same. The cephalic index of the student is slightly greater than either that of the Igorot or of the Iberian, which may be due to the influence of the Primitive type. The nasal index is less than the others, and may be due to the same influence coupled with that of the Iberian, and like influences may have altered the stature.

The disharmonic physiognomy suggests the Cro-Magnon of prehistoric Europe (8), but the small size of the individuals in every dimension almost precludes any relationship, unless environment accounts for the differences. The Cro-Magnon of Europe was noted for great height; long, high, narrow head; prominent occipital region; and large, square face. If the Australoid type is a remnant of the Cro-Magnon, great changes have taken place.

In conclusion then, the Australoid type among the students resembles the same type among the Igorots in cephalic index, nasal index, and physiognomic face index, and it differs from the Iberian in nasal index, morphologic face index, and number of decayed teeth, in which characters it resembles the following type.

PRIMITIVE TYPE.

Only nine students of this type occur in 377, a comparatively small number, but the type justifies itself because of its distinctive characters. (Table 1.) The head is wide, the nose and face are wide, and the stature is small. Two of the nine have wavy hair; 40 per cent have no decayed teeth and the average number of decayed teeth is 3 less than the Iberian and 2 less than the Australoid; there are no mestizos among them; they come from the Provinces of Rizal, Bulacan, Ilocos Sur, Cavite, Pangasinan, Leyte, and Union.

The cephalic index of this type is about 10 higher than the Iberian, the nasal index is 12.6 higher, and the stature is 13.5 centimeters lower. The head length is 1.3 centimeters less than the Iberian, the head width is 8 millimeters greater, the nose is 9 millimeters shorter, and 1 millimeter wider, and the face is 1 centimeter shorter and 3 millimeters wider. The parietal circumference is 1.2 centimeters more than the Iberian, the occipital circumference is 9 millimeters less, but the other circumferences are not so different. However, the fronto-parietal index is 2 less than the Iberian, the forehead-occipital is 1.4 more, the forehead-parietal is 3.5 less and the occipito-parietal is 1.7 less. This means that the parietal region is well developed and the occipital region is poorly developed in relation to the Iberian type, or the converse, the parietal region is poorly developed and the occipital region is well developed in the Iberian in relation to this type.

The teeth are notably free from cavities or any irregularities, and are the best teeth of all examined among the 377 students. The age is a little more than that of the Iberian, therefore the differences are not due to less maturity. This type is believed to be a primitive precursor of the Filipino, but whether Negrito or some other it is difficult to decide.

MODIFIED PRIMITIVE TYPE.

Forty-six individuals of this type appear of whom none are mestizos and 7 have wavy or curly hair. They come from Laguna, Ilocos Sur, Bulacan, Pangasinan, Nueva Viscaya, Cavite, Cagayan, Pampanga, Nueva Ecija, Ilocos Norte, Batangas, Union, Negros, Rizal, Capiz, Masbate, Tayabas, Iloilo, Romblon, Zambales, Bataan, and two from the city of Manila.

This type is below the average stature, very broad headed and broad nosed, and has a short, wide face. The frontal and parietal regions are relatively well developed, and the occipital region is poorly developed. In addition, the teeth are sound, the individuals are further advanced in age, and the weight is a little greater in proportion to stature than the average. (Table 1.)

Compared with the Iberian type the cephalic index is 10.4 greater, the nasal index is 19 greater, the stature is 4.2 centimeters less, the morphologic face index is 6.9 less, and the physiognomic face index is 3.9 greater. The head length is 1.2 centimeters less, the head width is 9 millimeters more, and the head height is 1 millimeter more. The nose length is 7 millimeters less and the nose width is 3 millimeters more. The lower face height is 6 millimeters less, the upper face height is 4 millimeters less, and the bizygomatic width is 4 millimeters more. The frontal circumference is 8 millimeters more, the parietal circumference is 4.5 millimeters more, the forehead circumference is 1 millimeter more, and the occipital circumference is 15 millimeters less.

This type is similar to the Primitive except in stature, in which it is not only about 10 centimeters greater, but in which there is no overlapping of the extremes between the two. The wavy hair and the broad nose indicate Negrito affinities. The type is probably the Primitive modified by European types and mixed with some Negrito blood. The head, nose, and face are wider than the people of the Malay peninsula (17) and the stature is higher.

MODIFIED ALPINE TYPE.

There are 30 students of this type of whom 8 are mestizos. They come from Ilocos Sur, Rizal, Union, Nueva Ecija, Bulacan, Leyte, Iloilo, Laguna, Tayabas, Batangas, Mindanao, Zambales, Ilocos Norte, Cavite, Marinduque, Lubang Islands, Capiz, Pampanga, Batangas, Isabela, Negros, Pangasinan, the city of Manila, and the father of one is from Spain.

This type is below the average stature, very broad headed, very narrow nosed, and it has a face intermediate between the Iberian and Primitive. The head size is like that of the Iberian except in the occipital region where it is like the Primitive. In addition, this type has very good teeth and is not fat. No wavy hair is found. (Table 1.)

Compared with the Iberian, this type has the cephalic index 11.7 greater, the nasal index 1 less, the stature 1.1 centimeters less, the morphologic face index 3.6 less, and the physiognomic face index 2.9 greater. The head length is 1.5 centimeters less, the head width is 8 millimeters more, and the head height is 0.6 millimeter less. The nose length is 0.7 millimeter less, that nose width is 0.8 millimeter less. The lower face height is 2.5 millimeters less, the total face height is 3.3 millimeters less, and the bizygomatic width is 2.8 millimeters more. The frontal and parietal circumferences are the same, the forehead circumference is 3 millimeters less, and the occipital circumference is 1.3 centimeters less.

The nearest living related people are the Alpine of middle Europe (10, 25) who are represented to some extent among the Spaniards. The type is therefore called modified Alpine, and represents a blend of Spanish and Filipino. Some Chinese may be present because three individuals are noted as resembling Chinese, and the Alpine Chinaman is a type often seen in Manila (4).

MODIFIED B. B. B. TYPE.

The 21 students of this type have indications of both Spanish and Chinese characteristics. Five are mestizos, 10 resemble Chinese, and 1 has wavy hair. They come from the Provinces of Pampanga, Bulacan, Batangas, Cavite, Nueva Viscaya, Nueva Ecija, Rizal, Zambales, and the city of Manila, all from the Island of Luzon.

The chief characteristics of this type are stature above the average, very wide head, but comparatively narrow face and very narrow nose. The number of decayed teeth is large and the age is above the average. (Table 1.)

Compared with the Iberian this type has the cephalic index 11 greater, the nasal index 1.9 less, the stature 4.5 centimeters greater, the morphologic face index 3.7 less, and the physiognomic face index 2.9 greater. The head length is 1.1 centimeters less, the head width is 1.1 centimeters more, and the head height is 1 millimeter more. The nose length is 1 millimeter more, and the nose width is exactly the same. The lower face height is the same, the total face height is 1 millimeter more, and the bizygomatic width is 6 millimeters more. The frontal circumference is 8 millimeters more, the parietal circumference is 5 millimeters more, the forehead circumference is 4 millimeters more, and the occipital circumference is 9 millimeters less. The size of the regions of the head is almost identical with the Primitive type, but the stature is 8.7 centimeters more, and the nasal index is 20.9 less.

This type represents the blending B. B. B. of the Spanish and Chinese population with the Primitive type of the Filipino people. The B. B. B. is the big cerebellumed, box-headed Bavarian of Ranke, so-called by Beddoe(5), and the type is a prevailing one among the Spaniards of the Philippines. I believe the B. B. B. type is a blend of the Alpine and Iberian of middle and southern Europe, with possibly an infusion of Cro-Magnon and Adriatic, the last two probably related to the Iberian and Alpine respectively as progenitors or offshoots.

The broad head of the Primitive type is combined with the narrow nose of the B. B. B. and the face is a blend of the two types. This is the reverse of the condition found in the Australoid type, where the long head of the Iberian has combined with the broad nose of the Primitive. These two types may, however, represent a recombination in different ways of characters belonging to only two types, one European, the other Eastern; one with long head, long nose, long face, and tall stature, the other with broad head, broad nose, broad face, and small stature. If this be true, it indicates Mendelian tendencies for the four characters mentioned, and there should be found in the total population as many types as the possible combinations of four characters in unit pairs permit, which is 16. There are, however, only 8 types, which is the proper number for three Mendelian characters, stature, cephalic index, and nasal index, by which these types are selected. There is evidence of blending in all, as well as the evidence of Mendelian tendencies, therefore my supplementary theory of heredity fits the conditions(2). The students are probably in an earlier stage of blending than the Igorots, and may be represented by Spurious Mendelism at B^1 and nearer 2 than 3, whereas the Igorots are in the stage of No Mendelism at B 2 near 3.

MODIFIED ADRIATIC TYPE.

There are 24 individuals of this type, of whom 6 show evidences of European characters, 1 is a Chinese mestizo, and 3 others resemble the Chinese. Two have curly hair. The characteristics of the type are stature above the average, very wide head, wide nose, moderately wide face, and well developed frontal region, but poorly developed parietal and occipital regions. A large number have no decayed teeth, but as many have bad teeth, which accounts for the high average number of decayed teeth. The age is above the average. (Table 1.) The individuals come from Union, Bohol, Bulacan, Pampanga, Capiz, Pangasinan, Tayabas, Iloilo, Negros, Rizal, Zambales, Bataan, Laguna, and the city of Manila.

Compared with the Iberian, this type has the cephalic index 12.8 greater, the nasal index 19 greater, the stature 4.3 centimeters greater, the morphologic face index 8.4 less, and the physiognomic face index 4.3 centimeters greater, the head length is 1.4 centimeters less, the head width is 1.1 centimeters more, and the head height is exactly the same. The nose length is 7 millimeters less, and the nose width is 3 millimeters more. The lower face height is 7 millimeters less, the total face height is 4 millimeters less, and the bizygomatic width is 5 millimeters more. The frontal circumference is 5 millimeters more, the parietal circumference is 1 millimeter less, the forehead circumference is 2 millimeters less, and the occipital circumference is 3 millimeters less.

The notable characteristics of this type are the great height, 2 centimeters less than the average for the white race in Europe and America(10), the wide, short head, the wide nose, the short, narrow face, and the well developed frontal region of the head. The nearest related living people are the Adriatic described by Deniker(10) and located on the northern shores of the Adriatic Sea. Except for the stature and the nasal index, both of which are too high, it resembles the Alpine or middle European. The stature is not so great as that of the Adriatic and the nasal index is greater, these differences being caused by the Filipino element. The Chinese influence is evident in the stature, nasal index, and cephalic index.

BLENDING TYPE.

This group of Filipinos with cephalic index ranging from 79 to 89, nasal index from 72 to 93, and stature from 146 centimeters to 180 centimeters, is composed of characters belonging to several types, and an effort will be made to discover what may have been the characteristics of these types. The European, the Primitive, and the Negrito undoubtedly enter into the composition of the Filipino people, but to what extent is each a factor and are the three represented in this group of average Filipino students? In order to answer these questions the group is analyzed as follows:

The cephalic index is first divided into three groups about 80, 83, and 86.

Cephalic index by groups—males—blending type.

Cephalic index.	77.	78.	79.	80.	81.	82.	83.	84.	85.	86.	87.	88.	Total.
About 80	3	16	21	23	19	8							90
About 83						16	22	19	4				61
About 86									10	14	6	6	36
Total	3	16	21	23	19	24	22	19	14	14	6	6	187

The divisions between the groups are made by using the nasal index as a differentiating factor. Those with a cephalic index of 82 and a nasal index below 80 are put into the group "about 80," whereas those with a cephalic index of 82 and a nasal index above 80 are put into the group "about 83." Likewise those with a cephalic index of 85 and a nasal index below 80 are put into the group "about 83," whereas those with a cephalic index of 85 and a nasal index above 80 are put into the group "about 86." This is a somewhat arbitrary method but I believe it represents a real natural grouping.

Using the cephalic index as grouped, the nasal index is compared with it.

Nasal index by groups—males—blending type.

Nasal index.	70.	72.	74.	76.	78.	80.	82.	84.	86.	88.	90.	92.	Total.
Cephalic index about 80	......	3	13	8	12	17	9	7	8	5	7	1	90
About 83	......	......	7	6	14	14	3	8	4	2	1	2	61
About 86	......	......	1	1	2	9	7	7	8	0	1	......	36
Total	......	3	21	15	28	40	19	22	20	7	9	3	187

In this table four groups of nasal indices are apparent but to show the relation of nasal index to the three groups of cephalic index the table may be simplified by condensed grouping in percentages.

Nasal index by groups—males—blending type—percentages.

Cephalic index.	Nasal index.			
	72 to 77.	78 to 83.	84 to 89.	90 to 93.
About 80	27	42	22	9
About 83	21	51	23	5
About 86	6	50	41	3
Total	54	143	86	17

A glance at this table will show that the nasal index varies slightly with the three groups of cephalic index, the percentage of extremes constantly decreasing with increase of cephalic index, whereas the percentage of intermediate nasal indices increases with increase of cephalic index. The correlation of nasal index and cephalic index is closer in the group with cephalic index "about 86" than in the other groups, there is less "spread" of nasal index, and the average or mean is higher. This indicates that the group about 86 is more homogeneous than the other two in the relation of cephalic index to nasal index, and this group may be segregated as a type whereas the other two are so heterogenous as to be considered only a group of blends.

The stature adds confirmation to the justice of this separation and approves the type as a reality.

Stature by groups—males—blending type.

Cephalic index.	Stature.																		
	146.	148.	150.	152.	154.	156.	158.	160.	162.	164.	166.	168.	170.	172.	174.	176.	178.	180.	Total.
About 80					2	4	5	16	17	13	10	9	6	2	2	3	0	1	90
About 83	1	0	0	3	2	2	5	8	8	6	7	8	6	3	2				61
About 86			1	2	2	4	6	5	1	3	4	3	2	0	2	0	1		36

This table may be simplified by condensed grouping in percentages.

Stature by groups—males—blending types—percentages.

Cephalic index.	Stature.		
	Below 160 centimeters.	160 to 165 centimeters.	Above 165 centimeters.
About 80	12	51	37
About 83	21	37	42
About 86	25	33	42

A glance at this table shows that the number of individuals with both small and large stature increases with increase of the cephalic index, and the group with a cephalic index about 86 has a greater percentage of large than of small stature. In the latter respect the group about 83 is similar, whereas the group about 80 is different, and it is also more homogeneous than the other groups. When the ratio of nasal index to cephalic index is compared with the stature above 165 centimeters and the stature below 165 centimeters, the difference in stature bears a constant relation to this ratio in the group "about 86," whereas it is different in the other groups as the following table indicates:

Relation of the ratio of cephalic index and nasal index to stature—blending type—percentages.

	Stature below 16 centimeters.			Stature above 165 centimeters.		
Ratio	—2 to —12	1 to —1	2 to 12	—2 to —12	1 to —1	2 to 12
Cephalic index:						
About 80	13	20	27	12	14	12
About 83	24	16	13	33	10	5
About 86	31	28	0	25	14	3

The ratio of the nasal index to the cephalic index is the difference between the two in any individual and it is represented by the number of points that the nasal index is above (+) or below (—) the cephalic index. For instance, if the cephalic index is 81 and the nasal index is

78, the individual is in the group about 80 under "—2 to —12" and depending upon stature is above 165 centimeters or below 165 centimeters.

One notable fact presented by this table is that, regardless of stature, the group about 86 has nasal indices less than the cephalic, whereas the group about 80 has nasal indices more than the cephalic indices. The group "about 83" is intermediate, especially those with stature below 165 centimeters. The group about 80 is the only one in which the stature apparently alters the ratio. Here those with tall stature have an equal number of nasal indices above and below the cephalic, whereas those with small stature have a greater number with nasal indices above than below the cephalic indices. This represents a tall element with mesocephalic heads and relatively narrow noses, which is probably the Iberian and Cro-Magnon mixed with the Filipino. At the other extreme an element is found with small stature, brachycephalic heads and relatively narrow noses, which is probably the Alpine mixed with the Filipino. There is also an element with low stature, mesocephalic heads, and broad noses which is not of European origin, but mixed Australoid and Primitive, and another element with tall stature, moderately brachycephalic heads, and relatively narrow noses, which is probably the B. B. B. and Adriatic mixed with the Filipino. There is also a large element with intermediate stature, moderately brachycephalic heads and relatively small noses which is probably the ultimate blend of the other types and represents the Filipino of the future. Chinese elements which are similar to the Filipino and European types previously described enter into this blending type(4). Negrito elements are present as indicated by the curly hair, of which 2 per cent are found in the group with cephalic index about 80, 10 per cent in the group with cephalic index about 83, and 9 per cent in the group with cephalic index about 86. The increased percentage of curly hair with increase of cephalic index points to Negrito rather than European influence, although the latter can not be excluded in accounting for the curly hair or broad head.

The remaining characteristics of the blending type are presented in detail in Table 1.

Only 30 mestizos belong to this type and of these 13 are found among the 35 tall, mesocephalic individuals with narrow noses that belong to the Iberian-Cro-Magnon group mentioned above on this page. Other indications that the Cro-Magnon influence is expressed in this group are that the sitting height is 1 centimeter more than the total of the blending type, the head length is 5 millimeters more, the total face height is 5 millimeters more, the bizygomatic width is 2 millimeters more, and each head circumference is 4 millimeters more, all of which brings this group nearer to the dimensions of the prehistoric Cro-Magnon than is any other type of Filipino(8).

Compared with the Iberian the blending type has the morphologic face index 4.2 less, and the physiognomic face index 2.4 greater. The head length is 1 centimeter less, the head width is 5 millimeters more, the head height is 1 millimeter more. The nose length is 3 millimeters less, and the nose width is 3 millimeters more. The lower face height is 4 millimeters less, the total face height is 3 millimeters less, and the bizygomatic width is 2 millimeters more. The frontal circumference is 2 millimeters more, the parietal circumference is 1 millimeter more, the forehead circumference is 2 millimeters less, and the occipital circumference is 9 millimeters less. The number of decayed teeth is 2.1 less, and the age is 1.3 years more. The cephalic index is 7.2 more, the nasal index is 10.9 more, and the stature is 5 millimeters less.

The blending type is below the average European stature(10), and would be considered small in comparison, the head is moderately brachycephalic, and the nose is mesorhinian. The face is wide and short. The type which is nearest this one in all dimensions should be the one which has exerted the greatest influence in molding the blend. A survey of the types in the following table reveals the differences:

Differences between the blending type and the other types.

Type.	Standing Stature.	Cephalic index.	Nasal index.	Morphologic face index.	Physiognomic face index.	Stature sitting.	Weight.	Decayed teeth.
Modified Iberian	0.5	7.2	10.9	4.2	2.4	0.6	0.3	2.1
Australoid	16.8	5.6	7.9	1.1	0.7	1.8	1.3	1.1
Primitive	13.0	3.1	1.7	3.6	3.6	4.6	5.2	0.8
Modified Primitive	3.7	3.2	8.1	2.7	1.5	2.5	1.3	0.3
Modified Alpine	3.6	4.5	11.9	0.6	0.5	2.0	3.1	0.3
Modified B. B. B.	5.0	3.8	12.8	0.5	0.5	1.9	2.6	1.3
Modified Adriatic	4.8	5.6	8.1	4.0	1.9	1.1	2.5	0.0

The blending type is nearer the modified Iberian in standing stature, sitting stature, and weight; it is nearer the Primitive in cephalic index and nasal index; it is nearer the modified B. B. B. in morphologic face index and physiognomic face index; it is nearer the modified Adriatic in the number of decayed teeth, but the modified Alpine is as near as the modied B. B. B. in physiognomic face index. The Australoid is very near in the two facial indices, the modified Alpine is near in standing stature and the modified B. B. B. is near in sitting stature. The Blending type seems to be molded in body more by the European types, and in head form and nose form by the Eastern types. The face form is also probably molded more by the Eastern types, because it is similar to the Alpine, B. B. B., and Adriatic, and the Alpine is believed to be Asiatic in origin and the Adriatic and B. B. B. are related to the Alpine. The Iberian, then, is the only distinct European type, and the notable differences between this type and the others lie in head form, nose form, face form, and number of decayed teeth.

DISCUSSION.

The Iberian, Alpine, and Adriatic of Europe(10) should be compared with modified types of like nature in the United States(3) and with similar types among the Filipinos in order to establish relationships and differences and, if possible, to determine the trend of development.

	Iberian.			Alpine.			Adriatic.		
	Filipino.	Europe.	United States.	Filipino.	Europe.	United States.	Filipino.	Europe.	United States.
Stature	164.3	161–162	170.8	160.2	163–164	169.4	168.6	168–172	175.0
Cephalic index	75.2	73–76	76.8	86.9	85–87	81.4	88.0	85–86	81.6

The stature of each type is greater in America than in Europe, and greater in Europe than in the Philippines, except the Iberian, which is greater in the Philippines. The Filipino Iberian has Cro-Magnon elements which may account for his greater stature. The cephalic index is more mesocephalic in America and more brachycephalic in the Philippines, except again in the Filipino-Iberian type, which is more dolichocephalic than the American Iberian, but more mesocephalic than the European Iberian. Here again, the influence of the long headed Cro-Magnon as well as the broad headed Primitive explains the difference. The nose of the Filipino is notably wider than that of the European.

The tendency in the Philippines seems to be toward reduced stature, wide heads and noses in so far as the European types are concerned, although the Iberian is only slightly modified. This may be because the Iberian is a purer or an older type than the Alpine, Adriatic, B. B. B. or Cro-Magnon, or because it is more unlike the Filipino types than are the other European ones, and, in spite of crossing with the Filipino, it does not blend. The Iberians may be dominant and the other types recessive or *vice versâ* in cross breeding.

On the other hand, the Filipino types are themselves becoming altered through the influence of the European and in the opposite direction; they are becoming taller, more mesocephalic and less wide nosed. This is evident in the Modified Primitive type, and in the Australoid as compared with the Australoid of the Igorots, as well as in the Blending type as compared with the Primitive and Australoid. The American white and the American negro will in time intensify the increasing stature and decreasing cephalic index, but the nose may continue to be as wide as at present.

It can not be overlooked that the Primitive, the Alpine, and the Adriatic as well as the B. B. B., are related to each other, and are separated only by relative factors such as slight differences in stature, cephalic, nasal, and face indices. This may lead to one of two conclusions: Either the Primitive type represents the fundamental one and the others are products of evolution from it, or the Primitive is a product of the other types as a result of nurture, degeneration, etc., or otherwise the types are different in origin and formation. It is more than probable that the Primitive represents one of the elements of the ground work of the East, and it may be that modified representatives of this type have influenced western Asia and Europe, and it is also more than probable that European elements have migrated eastward and formed the modified types.

The question arises, are the modified European types the result of recent or remote amalgamation? Are they the product of prehistoric or recent European mixtures?

A recent cross will not be so much blended as a remote one in which amalgamation has been continuous(2), unless the types that cross resemble each other closely, in which case amalgamation takes place rapidly. Therefore the Iberian, at least, represents a recent cross, as is probably true of the Alpine, B. B. B., and Adriatic as well. The Cro-Magnon, however, represents an ancient element and belongs to pre-Spanish as well as Spanish times. If the Australoid type is the product of Iberian and Negrito, or Iberian and Primitive, then the Iberian must have been an ancient as well as a modern type to have become blended even in a disharmonic manner, as is the case among the Igorots. The ancient type must have come at an early period in world-time in order to have amalgamated so completely with the others, or else our ideas of the time necessary for complete amalgamation need revision; it must be shorter than has been supposed, and new types are produced in man in a few hundreds of years instead of thousands. It may be that amalgamation is more rapid where early marriages are contracted, promiscuity is practiced, and under certain climatic conditions, where rapid development is the rule. If these three conditions have prevailed in the Philippines, it is possible that diverse types have become blended or amalgamated in short periods of time. However, it is probable that European types entered into the composition of the Filipino people before the Igorots reached the Islands, and it may be that these were the early prehistoric types of Europe, or products of such types as the Cro-Magnon, Laugerie-Chancelede, and Iberian, with also those resembling the Alpine, B. B. B., and Adriatic, such as have entered into the population of the Pacific Islands as far east as Hawaii, and to-day are represented by a remnant in Japan, namely the Aino(1,21,22,28). It is probable that the European types had become diversified before leaving their homes in Europe, or else those represented in the East would all be alike, whereas there are at least two diverse elements, one of which is long headed, long faced, and narrow nosed, and the other wide headed, with moderately narrow face and nose. Further investigations are necessary to determine these questions. At present we can say that at least traces of the Cro-Magnon are found among the Filipinos, the Iberian is present in comparative purity, and the Alpine with its affiliated types, the B. B. B. and Adriatic, are represented to some extent. The blending of all types except the Iberian has progressed a long way toward complete amalgamation, and the resulting product is below the average stature, slightly brachycephalic and moderately wide nosed. Of course this applies mainly to the better classes of the littoral population, and not to the Filipino of the rural districts, or to the non-Christian tribes of the interior of the Islands. At least two types, the Australoid and the Primitive, and probably a third, the Modified Primitive, constitute elements of the littoral population which are other than European in origin, although primitive European elements can not be excluded from the Australoid and the Modified Primitive types.

I have purposely avoided the use of the word Malay because I have been unable to decide to my own satisfaction what type is Malay, if there be such a type. For the same reason I have used the word Negrito sparingly. Judging by the usually accepted knowledge of these two races, the Negrito and the Primitive are alike except in hair texture, and the Malay and the Modified Primitive are alike throughout.

The Primitive type is almost identical with the type N of the Igorots. The following differences are found:

	Stature.	Cephalic index.	Nasal index.	Number.
Primitive	150.8	85.5	86.5	9 in 377
Igorot type N	150.3	84.3	89.4	8 in 101

It is evident that these are the same type, and that it is rarer among the students than among the Igorots. The finding of two types, the Australoid and the Primitive, among the Igorots and among the littoral people of the Philippines is indicative of a similar origin for a part of the two peoples. However, there is a difference between the two peoples in the remainder of the population. No type among the littorals corresponds to type M of the Igorots unless it be the Cro-Magnon, although the B. B. B. is similar in stature and nasal index, but not in cephalic index. The above corroborates my supposition stated in the discussion in the Igorots. The Australoid and Primitive had been mixed with type M before the entrance of the Igorots into the Philippines. These three types constitute the so-called Proto-Malays or Primitive Malays. That two of the types of the Proto-Malays remain in the littoral population may be due to a residue of these people who remained when the Neo-Malays took possession of the lowlands, or it may be because of the fact that the Neo-Malays contained these two types in their composition. The nonappearance of type M in the littoral population may be explained by its absorption or modification by the Neo-Malays, the type not having constituted a part of the latter, which is most probable. The distinctive difference between the Igorots and the littoral population is in the presence of type M among the Igorots and its absence among the littoral population, as well as the presence in the latter of recent European types with greater stature and greater brachycephaly.

M. Moszkowski(22) investigated the natives of east Sumatra (not Malays) and reports two peoples, the Orang Akett and the Orang Sakei, who correspond in physical measurements with the Primitive and the Australoid, as may be seen in the following table:

	Number.	Stature.	Cephalic index.	Morphologic face index.
Orang Akett (Moszkowski)	13	151.88	81.3	193.77
Primitive (Bean)	9	150.80	85.5	78.8
Orang Sakei (Moszkowski)	117	154.74 to 156.17	73.8 to 75.9	94.8 to 99
Orang Sakei (Pinger)	19	156.16	75.45	96.6
Australoid (Bean)	30	161.00	76.8	89.3

Except for differences in the face index the types are practically the same. The Orang Akett have wooly hair and resemble the Negritos, and the Orang Sakei have wavy hair and resemble the Veddahs and the Senoi of Martin. In spite of the lack of wooly or wavy hair among the Australoid and Primitive, I am convinced that these types are of the same stock as those of the Malay Peninsula(17), of east Sumatra(21), and of Ceylon (Sarasin), as well as other parts of the East(6,15) (Negrito). In the last named places the Negrito element has remained more or less predominant, whereas in the Philippines it has become swamped in the waves of immigration, with consequent loss of the characteristic curly or kinky hair which occurs only rarely.

FORECAST.

If the Australoid and the Primitive types represent the original elements of the Filipinos, and the other types represent modifications caused by Europeans and Chinese, recent and remote, then the individuals of the present population are larger than the original in all physical measurements. Continued immigration of Americans and Chinese will result by interbreeding in further increase of size. With increase of size go increase in bodily and mental vigor. Advance on the part of the Filipinos will be coincident with and incident to the continuation of the amalgamation of the races, although better nutrition, fewer animal parasites, and altered hygiene may assist in the advance.

In future papers I hope to be able to demonstrate the prevalence of certain diseases in definite morphologic types of men in the Philippines, which may indicate the types that fare well in the Tropics, as well as those that do not.

Mention was made in the beginning of the present work, of the summits of the curves of stature, cephalic index, and nasal index which suggested the cornfield of Schull with its "heterogeneous collection of elementary species and hybrids between them," and Spillman's explanation of the elementary species on the "old Darwinian idea of gradual evolution" as represented by a simple scheme which was delineated. The above selection of types is not an attempt to prove or disprove the application of this scheme to man, but is an earnest effort to find the exact composition of a mixed population. That the types fall somewhat into Spillman's scheme goes without saying, and that the summits of the curves correspond to different elements of the character represented by them is also true to some extent. The summit of the cephalic index (Chart II) at 76, represents the Iberian; at 78, the Australoid; at 80 and 83, as well as part of 86, the Blending type; at 86, the Primitive, Modified Primitive, and the B. B. B.; at 88, the Alpine and Adriatic; and at 92 some individuals of the Primitive, Modified Primitive, Alpine, B. B. B., and Adriatic. The summits of nasal index and stature are less exact than those of the cephalic index.

The gametic constitution of the types is as follows, in fulfilment of Spillman's scheme:

Iberian	A^5	B^2	C^5
Australoid	A^4	B^3	C^9
Primitive	A^2	B^4	C^7
Modified Primitive	A^4	B^6	C^9
Modified Alpine	A^4	B^7	C^5
Modified B. B. B.	A^6	B^6	C^4
Modified Adriatic	A^6	B^7	C^3
Blending type	A^5	B^5	C^7

A, in this scheme, represents stature, B, cephalic index, and C, nasal index, with equivalents as mentioned on page 266. Many possible forms are missing and those present are near the median or below, except in the nasal index, where the highest extreme is almost reached. Individual forms probably bridge the majority of the gaps, and a perfect series could be constructed from them.

If plants and animals may be designated as elementary species by Spillman's scheme, on the "old Darwinian idea of gradual evolution," with equal propriety and verity that scheme may apply to man, and types selected above represent elementary species of men who have been formed by the blending of diverse types, as well as by gradual evolution.

MENDELISM AND STUDENT TYPES.

When the types of Manila Students are compared with the polyhybrids resulting from the crossing of two unlike tomato plants, great similarity in the number of polyhybrids and in their relative proportions is found.

Price and Drinkard (24) obtained eight forms of tomato plants upon crossing the Yellow Pear which is "characterized by pyriform shape and yellow color of fruit and green foliage" with the Honor Bright which "possesses the three opposite attributes of round or spherical fruit shape, red fruit color, and yellow foliage color." "In this cross there was noted complete dominance of green foliage color, red fruit color, and round fruit shape."

Suppose the green foliage color represents small stature, the red fruit color represents the round head, and the round fruit shape represents the broad nose; then the three characters combined represent the Primitive and Modified Primitive types. The three opposite characters, tall stature, long head, and narrow nose, represent a hypothetical type not present among the Filipino Students, but which conforms to the Nordic type of Deniker in Europe.

If two such types have crossed to produce the Filipino, then all possible combinations of the characters constituting the two types should be found according to Mendel's law of polyhybrids as formulated by Price and Drinkard:

"*When parents differing with respect to more than one pair of characters are crossed all possible combinations of these characters will be found in the* F^2 *generation and these combinations will occur in a definite numerical proportion.*" The following table shows the theoretical requirements for a Mendelian trihybrid, the actual proportions secured from 40 plants of the tomato as a result of the cross of the Yellow Pear and Honor Bright by Price and Drinkard, and the proportion of each type found among 377 students of the Trade and Normal Schools at Manila.

Mendelism and Student Types.

Theoretical result for 64 individuals.	Tomato hybrids, 40 plants.	
Per cent.		*Per cent.*
42	Green foliage, red and round fruit	37.5
14	Green foliage, red and pear fruit	7.5
14	Green foliage, yellow and round fruit	25.0
14	Yellow foliage, red and pear fruit	17.5
5	Green foliage, yellow and pear fruit	2.5
5	Yellow foliage, red and pear fruit	2.5
5	Yellow foliage, yellow and round fruit	5.0
1	Yellow foliage, yellow and pear fruit	2.5

377 individuals—Filipino types—Manila Students.

		Per cent.
Small stature, round head, broad nose.	Primitive and Modified Primitive	14.6
Small stature, round head, narrow nose	Alpine	8.0
Small stature, long head, broad nose	Australoid	8.0
Tall stature, round head, narrow nose	Adriatic	6.4
Small stature, long head, narrow nose	Iberian	6.6
Tall stature, round head, narrow nose	B. B. B.	5.6
Tall stature, long head, broad nose	Cro-Magnon	?
Tall stature, long head, narrow nose	?	....

According to this classification the two types corresponding to the Yellow Pear and Honor Bright tomato are the Adriatic and Iberian, but no doubt the crossing of two other varieties of tomato among the eight would produce a similar series to that in the table, therefore the Adriatic and Iberian were not necessarily the progenitors of the Filipino although they may have been.

We can conceive that the pure dominant, the Primitive, and the pure recessive, the Nordic, may have crossed to produce the eight types. The Primitive, being dominant, has persisted, and appears in a greater percentage than the other types; the Nordic, being recessive, has disappeared. The other types appear in proportions not unlike the theoretical expectancy, although the percentage is low except that of the Iberian and B. B. B. The high percentage of these may be due to recent Spanish infusion of the two types, which are characteristic of the Spanish population of the Philippines (Ears). The low percentage of the other types is due to the progressive increase of blends, which now amount to one-half the population. The *scheme for heredity* which explains the amalgamated condition of the Igorots(2) will assist in the understanding of the student types. If the Nordic type represents the European and the Primitive represents the Eastern, then the existing types may be readily accounted for by the action of Mendelism as indicated above, but there have been many types of Europeans and probably more than one type of the Eastern which have fused to form the present Filipino population. However, if we may suppose that two types similar to the Nordic and Primitive united to form the European populations (a fact that is not improbable), resulting in eight forms similar to the eight Filipino types presented in the table above, and if these eight forms have projected themselves through the East, uniting with the Primitive wherever encountered, then the eight types of Filipinos represent the remains of a departing Mendelism which is being swallowed up by amalgamation in the blend—the Filipino of the future.

The eight European forms may not all have penetrated the East, but, having been segregated in Europe, only a few of the forms need have come into contact with the Primitive to produce the eight Filipino types, because the eight forms could be present in two types.

The scheme used as a *supplementary theory of heredity*(2) may be used to present the conditions found among the Filipino students. The process of amalgamation is more complex than among the Igorots because there are more types, the types show greater differences, and the minglings have been more frequent. The littoral people have recent European and Chinese elements besides the primary types, which make recent as well as remote blends. The recent blends probably exhibit Mendelian effects in crossing, especially the European with the primary types. The Chinese having reached a condition of Spurious Mendelism at least, as indicated by a study of their ears(4), are blending with the primary types on the one hand and the European on the other, each of which is in a condition of No Mendelism or Spurious Mendelism, thus producing a variable blend without True Mendelian effects. The total population is thus thrown into a condition of Spurious Mendelism. Some elements which are already perfect blends, such as the Primitive, Australoid, and Iberian, when crossed with their own kind, should reproduce true to type, whereas others, which are extremely opposite, such as the Iberian and Primitive, probably exhibit True Mendelism, at least in some characters, when crossed.

Finally, it is evident that the presence of the types described in this paper corroborates to some extent the existence of similar types delineated in a study of Filipino ears(4). The definiteness of a few types and the blended condition of others, upholds the theory of heredity and the supplementary theory of heredity presented in previous papers.

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ILLUSTRATIONS.

CHART I. Stature. The small solid line represents the mestizos, the broken line the Filipinos, and the large solid line represents the total number of students.

II. Cephalic index. The lines are the same as in Chart I.

III. Nasal index. The lines are the same as in Chart I.

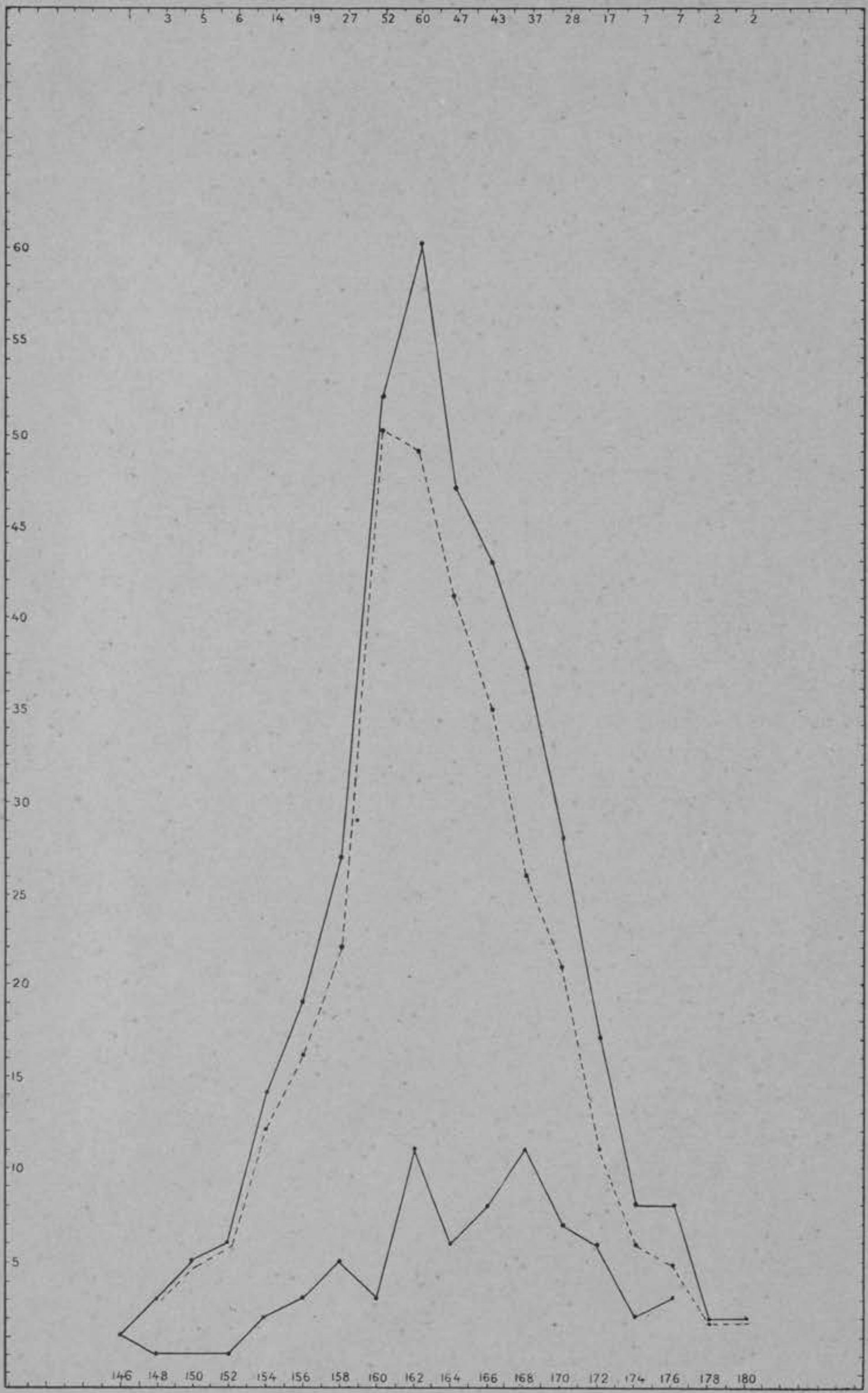
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Chart I.

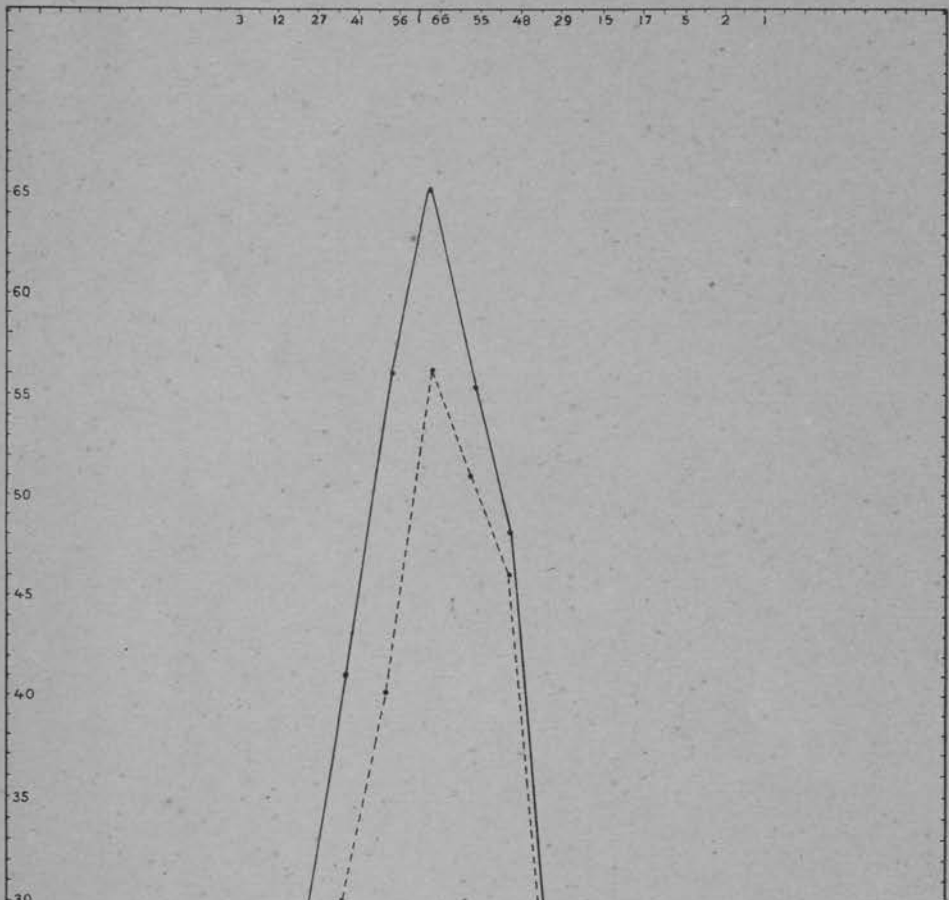
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CHART II.

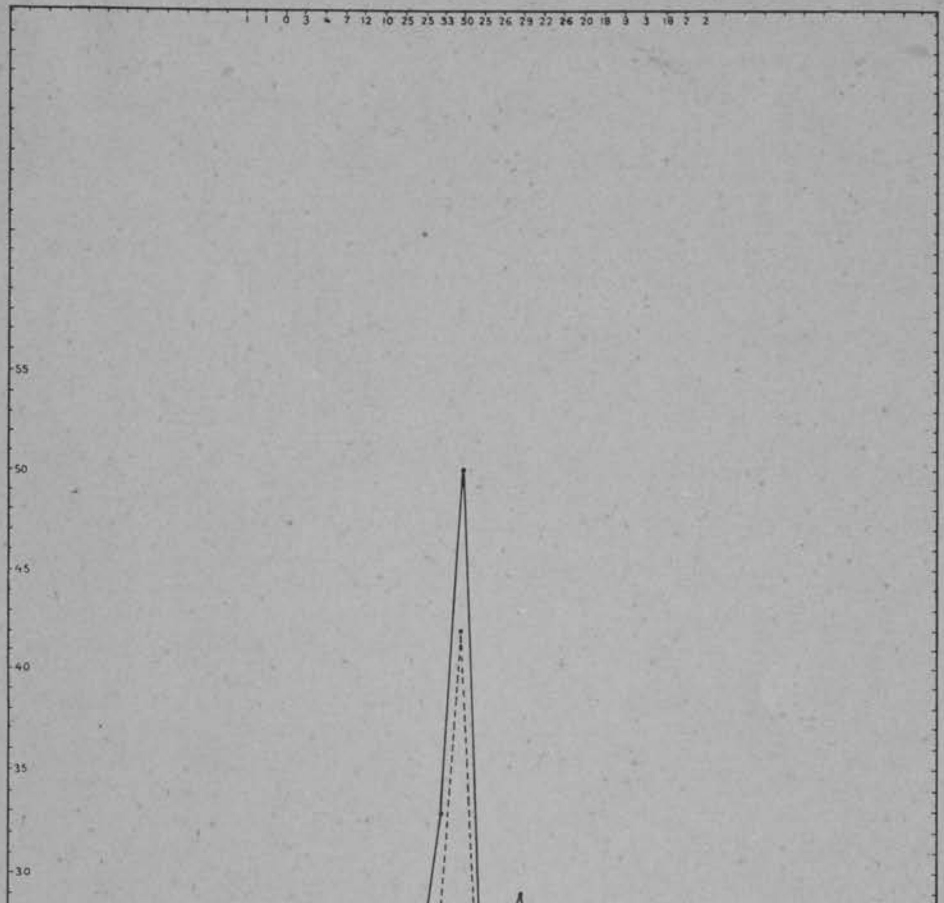
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CHART III.

TABLE 1.—*Types—adult male Filipinos.*

Character.	Modified Iberian, 25.			Australoid, 30.			Primitive, 9.			Modified Primitive, 46.			Modified Alpine, 30.			Modified B. B. B., 21.			Modified Adriatic, 24.			Blending, 187.		
	Maximum.	Mean.	Minimum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Maximum.
Cephalic index	72.0	75.2	78.0	74.0	76.8	82.0	80.0	85.5	93.0	80.0	85.6	92.0	80.0	86.9	98.0	78.0	86.2	93.0	80.0	88.0	97.0	77.0	82.4	88.0
Nasal index	60.0	73.9	80.0	83.0	92.7	102.0	85.0	86.5	100.0	81.0	92.9	105.0	60.0	72.9	89.0	58.0	72.0	81.0	84.0	92.9	105.0	72.0	84.8	92.0
Stature standing	154.0	164.3	172.0	147.0	161.0	173.0	148.3	150.8	154.6	156.0	160.1	164.9	152.0	160.2	164.5	165.6	168.8	172.9	165.0	168.6	177.0	146.0	163.8	180.0
Stature sitting	81.0	86.1	92.0	78.0	83.7	90.0	77.5	80.9	83.0	79.0	83.0	86.6	78.1	83.5	96.7	83.3	87.4	92.0	81.5	86.6	92.5	73.7	85.5	97.0
Morphologic face index	81.0	86.6	94.0	74.1	81.3	89.0	72.4	78.8	80.6	72.2	79.7	89.0	73.0	83.0	98.0	76.0	82.9	90.4	70.9	78.4	90.0	69.0	82.4	95.2
Physiognomic face index	69.0	73.2	84.7	70.9	74.9	82.5	72.8	79.2	84.8	67.5	77.1	84.5	66.0	76.1	81.8	70.0	76.1	93.3?	73.7	77.5	82.5	63.9	75.6	87.6
Head length	18.0	19.2	20.5	17.6	18.9	19.6	17.0	17.9	19.1	16.7	18.0	19.3	16.4	17.66	18.8	16.8	18.1	19.4	16.8	17.8	19.0	16.7	18.2	19.6
Head width	13.8	14.5	15.3	13.5	14.6	15.7	15.0	15.3	16.0	14.3	15.4	16.6	14.2	15.34	16.4	14.8	15.6	16.9	14.4	15.6	16.8	14.0	15.0	16.4
Head height	12.3	13.0	13.5	12.5	13.1	13.7	12.7	13.1	13.4	12.3	13.1	13.5	12.2	12.94	13.9	12.3	13.1	13.8	12.3	13.0	13.5	12.1	13.1	13.8
Nose length	4.1	4.9	5.8	3.6	4.15	4.6	3.7	4.03	4.5	3.8	4.2	4.7	4.0	4.83	5.30	4.3	5.0	5.4	3.8	4.2	4.9	4.0	4.6	5.4
Nose width	3.2	3.6	4.0	3.5	3.8	4.5	3.4	3.68	4.0	3.5	3.9	4.4	2.9	3.52	4.30	3.0	3.6	4.0	3.4	3.9	4.5	3.2	3.9	4.3
Chin to nasion	10.7	11.6	12.7	10.0	10.9	12.3	10.2	10.8	11.2	10.2	11.0	12.0	10.3	11.35	12.50	10.8	11.6	12.5	10.0	10.9	12.0	9.7	11.2	12.6
Chin to hair line	16.4	18.3	20.5	16.7	17.9	19.6	16.3	17.3	18.8	16.5	17.9	20.0	16.7	17.97	19.4	15.0?	18.4	19.7	17.0	17.9	19.4	15.7	18.0	21.6
Bizygomatic width	12.1	13.4	14.3	12.7	13.4	14.3	13.0	13.7	14.1	12.7	13.8	15.1	12.3	13.68	14.8	13.4	14.0	11.8	12.8	13.9	14.8	12.5	13.6	14.8
Frontal circumference	27.3	30.2	33.0	27.5	30.5	33.1	28.7	30.5	32.5	29.5	31.0	32.7	27.8	30.20	32.4	28.6	31.0	33.2	28.8	30.7	34.5	27.5	30.4	33.6
Parietal circumference	33.0	36.0	38.0	33.8	35.8	38.0	35.9	37.2	38.4	34.3	36.45	38.7	32.0	36.00	38.2	29.0	36.5	38.6	33.2	35.9	38.0	29.2	36.1	39.8
Forehead circumference	25.4	27.2	29.5	25.6	26.4	29.0	26.0	26.8	27.8	25.5	27.3	30.0	25.2	26.90	29.3	25.6	27.6	29.7	25.2	27.0	29.0	24.7	27.0	28.7
Occipital circumference	27.6	30.2	33.5	27.2	29.7	32.0	27.0	29.3	31.0	27.4	28.7	32.3	26.0	28.90	31.5	27.0	29.3	31.5	26.4	29.1	31.0	27.0	29.3	33.5
Fronto-parietal index	79.0	84.0	92.0	77.9	85.2	94.3	74.7	82.0	90.8	80.0	85.0	92.0												
Forehead occipital index	80.0	90.0	104.0	83.9	88.9	100.0	85.8	91.4	97.0		95.1													
Fronto-occipital index		100.0								98.4	108.0	114.5												
Forehead parietal index		75.5			73.7		70.0	72.0	76.0		74.9													
Occipito-parietal index											78.7													
Weight	39.2	50.0	63.2	40.5	49.0	68.3	38.2	45.1	51.5	41.5	49.0	60.8	38.6	47.16	53.5	49.8	52.9	69.6	40.0	52.8	64.0	33.6	50.3	71.0
Decayed teeth	[a]0.0	4.8	22.0	[b]0.0	3.8	19.0	[a]0.0	1.9	5.0	[c]0.0	2.0	13.0	[d]0.0	2.40	8.0	[a]0.0	4.0	15.0	[e]0.0	2.7	10.0	[f]0.0	2.7	20.0
Age	18.0	19.0	22.0	18.0	19.0	25.0	18.0	19.7	26.0	18.0	21.3	26.0	18.0	19.6	22.0	18.0	20.6	29.0	18.0	20.4	28.0	18.0	20.3	31.0

[a] 4 students of this type have no decayed teeth.

[b] 8 students of this type have no decayed teeth.

[c] 20 students of this type have no decayed teeth.

[d] 14 students of this type have no decayed teeth.

[e] 9 individuals of this type have no decayed teeth.

[f] 59 students of a possible 187 have no decayed teeth, exactly one-third.

TABLE 2.—*Measurements classified by locality.*

Locality.	Number.	Stature.	Cephalic index.	Nasal index.	Head length.	Head breadth.	Nose length.	Nose breadth.
City of Manila:								
Filipinos—								
Average	40	163.8	82.3	83.8	18.1	14.9	4.39	3.69
Maximum		179.3	90.0	102.0	19.6	15.5	5.10	4.30
Minimum		151.8	76.0	68.0	16.7	13.8	3.70	3.20
Mestizos—								
Average	23	163.1	77.2	78.9	18.9	14.6	4.65	3.67
Maximum		176.5	72.0	95.0	20.5	15.5	5.40	4.30
Minimum		146.1	84.0	66.0	17.8	14.0	4.00	3.20
Rizal Province:								
Filipinos—								
Average	31	162.8	83.4	83.2	18.1	15.1	4.47	3.72
Maximum		172.0	92.0	105.0	19.4	16.2	5.10	4.20
Minimum		148.8	74.0	64.0	16.3	13.5	3.80	3.30
Mestizos—								
Average	7	166.3	78.4	79.8	19.0	14.9	4.71	3.76
Maximum		169.5	81.0	84.0	19.8	15.3	5.00	4.20
Minimum		160.5	75.0	72.0	18.0	14.2	4.40	3.30
Laguna Province:								
Filipinos—								
Average	14	162.6	81.3	84.3	18.2	14.8	4.39	3.70
Maximum		173.5	91.0	100.0	19.1	16.4	4.90	4.10
Minimum		153.7	75.0	70.0	17.7	14.0	3.70	3.20
Mestizos—								
Average	6	162.7	78.5	80.3	18.6	14.6	4.56	3.60
Maximum		167.0	82.0	100.0	19.6	15.2	5.30	3.90
Minimum		156.6	74.0	64.0	18.0	13.7	3.70	3.30
Cavite Province:								
Filipinos—								
Average	10	166.7	82.9	81.0	18.5	15.4	4.64	3.76
Maximum		175.8	93.0	95.0	19.3	16.4	5.00	4.20
Minimum		154.6	75.0	68.0	17.6	14.3	4.30	3.40
ADULT MALES—NO MESTIZOS.								
Batangas Province:								
Average	12	164.2	83.7	79.8	18.2	15.2	4.7	3.8
Maximum		170.6	92.5	88.9	18.8	16.1	5.3	4.0
Minimum		156.6	76.9	72.0	17.1	14.3	4.0	3.4
Bulacan Province:								
Average	26	163.6	84.2	83.2	18.1	15.2	4.5	3.7
Maximum		173.5	90.1	97.3	19.0	16.9	5.3	4.1
Minimum		152.9	77.3	57.7	17.0	14.3	3.8	3.0
Tayabas Province:								
Average	15	160.6	83.3	83.3	18.0	15.0	4.6	3.8
Maximum		171.5	90.9	100.0	19.4	15.9	5.0	4.1
Minimum		149.7	77.0	75.0	16.9	14.3	4.0	2.9
Zambales Province:								
Average	9	165.1	84.1	79.2	18.3	15.6	4.8	3.8
Maximum		173.4	91.2	91.3	19.5	16.6	5.1	4.3
Minimum		159.5	80.0	72.0	17.3	15.1	4.6	3.5
Pampanga Province:								
Average	22	163.5	81.3	87.6	18.5	15.0	4.4	3.8
Maximum		172.2	90.5	100.0	19.6	15.7	5.0	4.5
Minimum		158.7	76.5	72.0	16.8	14.2	3.8	3.3

TABLE 2.—*Measurements classified by locality*—Continued.

Locality.	Number.	Stature.	Cephalic index.	Nasal index.	Head length.	Head breadth.	Nose length.	Nose breadth.
Pangasinan Province:								
Average	18	161.0	84.7	85.0	18.1	15.3	4.5	3.8
Maximum		170.0	93.1	100.0	19.2	16.1	5.4	4.1
Minimum		151.3	80.0	74.1	16.9	14.5	3.7	3.3
Nueva Ecija and Nueva Vizcaya Provinces:								
Average	17	166.1	83.6	80.0	18.3	15.3	4.8	3.9
Maximum		175.7	95.3	90.9	19.5	16.4	5.8	4.2
Minimum		158.1	79.0	69.8	17.2	14.4	4.2	3.6

TABLE 3.—*Comparison of measurements by groups.*

Authority.	Number.	Stature.	Cephalic index.	Nasal index.	Head length.	Head width.	Nose length.	Nose width.
Tagologs—Adult male—averages:								
Montano	4	158.0	83.69	82.52				
Folkmar	169	159.6	83.09	79.69	18.0	15.0	5.1	4.1
Bean—								
Filipinos	219	163.4	83.80	82.80	18.2	15.1	4.53	3.75
Mestizos	64	164.9	78.70	77.9	18.8	14.8	4.75	3.70
Total	283	163.8	82.20	81.9	18.3	15.1	4.58	3.75
Averages—adult males—no mestizos:								
Ilocanos—								
Montano	3	161.9	86.8	86.7				
Folkmar	193	160.2	81.8	75.4	17.8	15.1	5.20	4.00
Bean	48	161.5	83.5	81.8	18.2	15.2	4.30	3.65
Bicols—								
Montano	6	158.3	86.6	86.5				
Folkmar	63	159.2	83.2	81.5	18.0	15.0	5.0	4.1
Bean	14	163.2	83.5	86.3	18.2	15.2	4.5	3.9
Bisayans or Visayans—								
Montano	2	150.1	87.5	71.3				
Folkmar	259	158.7	84.4	81.7	17.9	15.1	4.9	4.0
Bean	23	160.7	84.3	87.3	18.2	15.4	4.1	3.8
Moros of Mindanao—								
Montano	5	157.4	81.9	84.6				
Folkmar	6	161.3	80.8	81.0	18.7	15.1	5.00	4.10
Bean	2	163.0	88.8	87.4	17.9	15.85	4.75	4.25
Cagayanes—								
Folkmar	15	162.2	80.8	80.4	18.4	14.9	5.1	4.1
Bean	3	165.6	83.6	80.9	17.7	14.8	4.7	3.8

The Tagalogs include all those enumerated in Table 2; the Ilocanos are those from Ilocos Norte, Ilocos Sur, and Union; the Bicols are from Camarines, Albay, Sorsogon, Romblon, and Masbate; the Visayans are from Iloilo, Capiz, Antique, Negros, Bohol, Leyte, and Samar.

TABLE 4.

[Montano, J. Rapport a M. le ministre de l'instruction publique sur une mission aux isles Philippines et en Malaisie 1879-1881 p. 354-360.]

	Indices.				Absolute stature.
	Cephalic.	Facial.	Frontal.	Nasal.	
Negritos—18 males—Mariveles and Batan:					
Mean	84.66	56.24	69.31	94.67	148.53
Maximum	89.79	61.04	74.65	122.80	157.50
Minimum	77.09	51.43	61.31	82.00	142.50
Negritos—12 females—Mariveles and Batan:					
Mean	86.95	55.93	72.64	96.62	143.16
Maximum	96.86	60.92	95.07	105.40	148.50
Minimum	80.56	53.03	66.90	88.09	135.00
Manthus—7 males—Malacca:					
Mean	80.01				148.87
Maximum	82.38				158.00
Minimum	76.66				139.00
Manthus—5 females—Malacca:					
Mean	81.40				142.38
Maximum	85.52				149.00
Minimum	76.70				133.00
Actas—2 males—Camarines Sur, Lucon:					
Mean	81.29	60.73	71.39	93.97	155.00
Bicols—6 males:					
Mean	86.63	56.79	71.96	86.51	158.33
Maximum	92.94	62.31	73.94	100.00	165.50
Minimum	81.14	56.05	67.74	79.59	147.20
Bicols—10 females:					
Mean	86.60	60.09	69.89	86.38	150.58
Maximum	91.18	66.67	72.41	94.74	161.00
Minimum	82.35	55.00	67.74	77.55	141.50
Tagalogs—4 males:					
Mean	83.69	59.70	68.06	82.52	158.00
Maximum	89.63	64.88	74.28	88.37	165.50
Minimum	80.55	57.01	61.29	60.00	150.50
Visayans—2 males:					
Mean	87.54			71.30	150.10
Maximum	89.63	64.88	68.02	82.61	151.20
Minimum	85.46	59.84	65.30	60.00	149.00
1 13 years old	82.35	62.40	74.28	85.00	133.80
1 male—Pangasinan	83.78	60.69	67.74	75.00	165.00
1 male—Pampanga	77.29	59.44	76.92	82.22	163.90
Ilocanos—3 males:					
Mean	86.78	63.95	71.26	86.71	161.90
Maximum	89.41	65.38	76.66	91.10	168.50
Minimum	85.22	61.31	65.79	80.42	158.20
Sulus—6 males:					
Mean	84.67	62.47	73.65	86.60	152.60
Maximum	87.88	74.59	78.77	95.24	159.20
Minimum	78.89	56.64	71.23	76.60	148.80
Sulus—1 females:					
Mean	86.72	54.31	69.96	85.05	143.03
Maximum	93.83	58.33	77.93	91.43	146.50
Minimum	77.14	50.41	60.53	73.91	139.80
Davao Moros—5 males:					
Mean	81.94	56.11	73.45	84.56	157.36
Maximum	87.11	62.96	78.57	95.35	162.50
Minimum	75.27	55.86	63.02	75.47	150.90
Halagan—1 male	79.46	54.80	76.19	102.50	166.50

APPENDIX.

STUDENTS' CLASS STANDING BY TYPE.

Since compiling the present work, the class standing of the students measured has been obtained from the Philippine Normal School and the Philippine School of Arts and Trades, through the kindness of Mr. Beattie, and with the assistance of Teodorico Planta, a student in the Philippine Medical School who copied the grades from the records of the two schools. Only the class standing for the year in which the students were measured was obtained. This is classified according to the type of student into three groups: literature, mathematics, and science. Literature includes history, geography, languages and such general subjects; mathematics includes of course arithmetic, algebra, geometry, etc.; and science includes physics, chemistry, botany, zoölogy, and practical courses necessitating handiwork.

The grades under each of the three classes are treated in three ways: first, the average is obtained, then the high grade and low grade students of each type are contrasted, afterwards the extremely good and the extremely bad students are discussed.

The class standing is relative and for obvious reasons should not be taken for comparison with other schools or other peoples, but I believe it is a satisfactory basis for the comparison of the students among themselves.

Average class standing of the students according to type.

Type.	Literature.	Mathematics.	Science.	Total.	Number of students.
Iberian	75.0	77.6	77.8	76.8	18
Modified Primitive	77.2	77.8	75.5	76.9	29
Australoid	73.4	75.7	74.3	74.5	20
Alpine	76.9	79.2	76.0	77.3	28
B. B. B	76.9	77.5	78.4	77.6	20
Adriatic	76.2	79.2	77.6	77.7	17
Total	76.1	77.4	76.5	76.8	126
Blends	76.0	75.3	77.1	76.1	144

The Australoid is the only type that has an average class standing appreciably different from that of the other types. It is lower than the others, and is approached most closely by the Blends. The average of the first three types given is less than that of the next three types, and the Adriatic average is the highest of all. The total average of all the types is greater than that of the Blends and the difference is due to the high mark of the types, and the low mark of the Blends, in mathematics. In the practical work of science the Blends are slightly better in class standing than the types and in the common branches of literature they are about the same.

In literature alone, the Modified Primitive excels and is closely followed by the Alpine and B. B. B. The Australoid has the lowest grade in literature received by any type for any subject.

In mathematics alone the highest grade received by any type for any subject is attained by the Alpine and Adriatic. The Modified Primitive comes third in mathematics, closely followed by the Iberian and B. B. B., whereas the Australoid ranks last except the Blends.

In the practical sciences, the B. B. B. stands easily first with the Iberian second and the Adriatic third. The Australoid is last in this as in all the subjects.

The absence of the Primitive may be noticed, and is due to the fact that the class standing of only three individuals is given. These are as follows:

Class standing of the Primitive Type.

Literature.	Mathematics.	Sciences.	Total.
76	75	75	75.3
76	84	68	76.0
80	85	78	81.0
[a]77.1	[a]81.3	[a]74.0	[a]77.4

[a] Total.

The average is greater than any type except the B. B. B. and Adriatic; the average in mathematics is the greatest of all and only in the sciences is the average low. Disregarding the average and considering the individuals only, there is evident high class standing of at least two students of the Primitive type in mathematics, and one student has a high mark in all three departments. Whatever the physical condition of the Primitive type, there is no evidence of mental deficiency, at least in the three students whose grades are presented above.

The average class standing indicates only slight differences between the types, therefore we turn to the constrast of high and low grade students.

The relation of the low grade to the high grade students by types.

Type.	Literature.		Mathematics.		Science.		Total.		Ratio of 69 to 80.				Number of students.
	69.	80.	69.	80.	69.	80.	69.	80.	Literature.	Mathematics.	Science.	Total.	
Iberian	2	2	1	8	4	8	7	18	10	80	20	26	18
Modified Primitive	2	11	4	11	4	9	10	31	55	28	23	31	29
Australoid	3	7	2	9	5	7	10	23	23	45	14	23	20
Alpine	3	10	2	12	4	8	9	30	33	60	20	33	23
B. B. B	2	9	2	9	1	9	5	27	45	45	90	54	20
Adriatic	3	7	2	9	1	8	6	24	23	45	80	40	17
Total	15	46	13	58	19	49	47	153	31	45	27	33	126
Blends	24	61	33	53	17	58	74	172	25	16	34	23	144

In this table only students who received grades which do not fall between 70 and 79 are included. This gives three classes of which the low grade received an average of 69 or less, the high grade an average of 80 or more, and the others intermediate grades called mediocre. The ratio is the number of students with grades above 80 divided by the number with grades below 69, and indicates the relative class standing.

The Iberian type has a large number of mediocre students in literature, and a small number in science, in both of which the ratio is low, but in mathematics, where there are an equal number of mediocre and extreme students, the ratio is high and it is exceeded only by the ratio of the B. B. B. in science. The total ratio of the Iberian type is low, however, lower than any except the Australoid and the Blends. The ratio in literature is lower than that of any other type in any subject.

The Modified Primitive type has a larger number of mediocre students than extremes in all departments. The ratio is high for literature but low for mathematics and science. The total ratio is low, a trifle lower than the average for the types, but not so low as the Blends.

The Australoid has more extremes than mediocre students but the extremes are low grade to a greater extent than the other types which makes the ratio low in every department. The total ratio is the lowest of all the types and exactly the same as the Blends with a particularly low grade in science.

The Alpine has more extreme than mediocre students, and in science the extremes are low grade, whereas in mathematics they are high grade. The ratio in literature and the total ratio are the same and equal exactly the total average ratio of all the types.

The B. B. B. type has about equal numbers of mediocre and extreme students, and the extremes are largely high grade. The ratio is mediocre for literature and mathematics but high for science, yet the difference is due to one student less in low grade science than in low grade literature and mathematics. The ratio is on this account greater than that of any other type, and more than twice as great as that of the Australoid and the Blends.

The Adriatic has a greater number of extremes than of mediocre students and the ratio of literature is low, that of mathematics mediocre, whereas that of science is high. The total ratio of the Adriatic is the second of all types being exceeded only by the B. B. B.

The types have a higher total ratio than the Blends, and the ratio of literature and mathematics is also higher, whereas that of science is slightly lower.

The extremely bad and the extremely good students, those with marks below 60 and above 89 respectively, are called Failed and Honor students.

There are none of these among the Iberians except 1 with a grade of 56 in mathematics.

The Modified Primitive has 1 Failed in each department, and 1 Honor in mathematics and science respectively.

The Australoid has 2 Failed in literature, 1 in mathematics, 2 in science, and 2 Honor men in mathematics.

The Alpine has 1 Failed in mathematics and 1 in science, and 2 Honor men in mathematics.

The B. B. B. has 1 Failed in mathematics, and 1 Honor man in mathematics.

The Adriatic has no Failed in any subject, but has 1 Honor man in literature and 1 in mathematics.

The Blends have 4 Failed in literature and 2 Honor men, 10 Failed in mathematics and 7 Honor men, and 1 Failed in science and 3 Honor men.

In contrast with this the types have 3 Failed in literature and 1 Honor man, 5 Failed in mathematics and 7 Honor men, 4 Failed in science and 1 Honor man. The Blends have 15 Failed and 12 Honor men, and the types have 12 Failed and 9 Honor men. The greatest difference between the Blends and the types is in mathematics and science. The types excel in mathematics and the Blends in science.

It would be unjust to draw conclusions from so small a number of students when the differences are so slight, therefore only a summary will be given.

SUMMARY.

The Adriatic, B. B. B., and Alpine types which are each composed of Filipino, Chinese, and Spanish elements have the highest class standing.

The Primitive and Modified Primitive, which are probably pure Filipino types have a better class standing than the Iberian and Australoid types which are probably composed of Spanish and Filipino elements alone. However, the Iberian has a high class standing in mathematics.

The Adriatic has the best class standing, the Australoid the worst.

The class standing of the types is better than that of the Blends, especially in mathematics.

The total class standing of all the students, considering the average, the low and high grade students, and the Failed and Honor men, is better in the sciences where practical handiwork is important, than it is in literature and mathematics where memory and imagination are important. There are, however, a relatively greater number of Honor men than Failed men in literature than in either science or mathematics, and there are more than double as many of both Failed and Honor men in mathematics as in either science or literature. Many students are either very good or very bad in mathematics.

II. FILIPINO TYPES: FOUND IN MALECON MORGUE.

By Robert Bennett Bean.

(*From the Anatomical Laboratory of the Philippine Medical School, Manila, P. I.*)

The bodies of the unclaimed dead in the city of Manila are brought to the Malecon Morgue of the Philippine Medical School where they are retained for forty-eight hours before final disposal. About 100 of such bodies were measured by me during the school year 1907–8, and the 70 adults—48 male and 22 female—so utilized are represented by detailed dimensions in Table V. Two Tagalogs, 2 Chinese and 10 Japanese, all living, who were measured at Baguio in 1908 at the same time that I measured the Benguet Igorots, are also included in this study.

The Filipinos whose bodies reach the Malecon Morgue usually belong to the *submerged tenth*, and should be so considered in any discussion or conclusions. However, they form an integral part of the population of the Philippine Islands, and belong to the series of investigations which I have undertaken of the Filipinos in different culture levels. I have already indicated differences in three culture levels in a study of Filipino Ears, a higher level than the three is given in a study of Filipino Types, I, and in the present study a lower level than the three is presented. The Japanese are probably from the lower middle class, if we may use the ordinary expression, because they are all day laborers—carpenters, etc.—who came to the Philippines after being dismissed from the Japanese army following the war with Russia.

The methods of measuring the body are the same as those used for the Benguet Igorots. The head measurements conform to the methods adopted by the commission of the continental (European) anthropological societies in 1906. No conscious selection was made, except that bodies which were distorted by the gas bacillus (*Bacillus aërogenes capsulatus* Welch) were not measured.

The brain weight is not exact except in a few instances where I myself did the weighing, because it was taken on untested scales by the morgue attendant; some of the brains are now preserved in the Wistar Institute of Anatomy, Philadelphia, Pennsylvania, and the Smithsonian Institution, Washington, District of Columbia, where they may be examined. They should be carefully studied in relation to the types of men from whom derived, which are delineated in detail in the following pages.

A series of tables covering the physical measurements of the groups of Japanese, Igorots, Manila Students, and the Malecon Morgue inmates, is presented at the end of this study.

The present work is divided into six sections, each of which is complete in itself but forms a part of the composite whole. A summary is given at the end of each section. The sections are as follows: I, Individual Types; II, Remaining Types; III, Head Outlines; IV, Amplified Scheme for Heredity; V, Group Averages; VI, The Relation of Morphology to Disease.

I. INDIVIDUAL TYPES.

The Japanese and the Morgue subjects will be compared with the Igorots and the Manila students comprising previous studies. Preceding this, the types of Japanese and of Filipinos will be selected and shown to coincide to some extent, and to resemble certain types of the students and of the Igorots.

The types have been selected in precisely the same way that the types of Manila Students were selected, and they will be presented in the following order: Iberian, Primitive, Australoid, Cro-Magnon, Alpine, B. B. B., Adriatic, and Blend, because this is probably the order of precedence in the appearance of the types, or their relative age in world time, the oldest being put first. The Iberian may be out of place, but it is used as the standard of comparison; therefore its position is logical.

THE MODIFIED IBERIAN TYPE.

The characteristics of this type were presented in a previous study of Filipino types among Manila students, and the average measurements are given in tables further on in this paper; therefore, only the principal characters that differentiate this type from the other types will be considered here.

Stature of the Iberian Type.

No.	Group.	Sex.	Stature.
5	Malecon Morgue	♂	163.4
8	do	♀	151.8
5	Japanese	♂	161.0
25	Manila students	♂	164.3

The stature of the three groups—Japanese, Morgue and Students—is so nearly the same as to indicate the homogeneity of the type. The Japanese Iberians are not so tall as the others, although the average stature of the 10 Japanese is greater than that of the 48 Morgue subjects. From this we may infer that the Filipino Iberian is taller than the Japanese Iberian, and, to account for it, the recent infusion of Spanish in the Filipino during the past few hundred years may be suggested. The Japanese Iberian probably came to Japan at a much earlier date than the Spanish arrived in the Philippines, and the Iberian is more completely amalgamated with the other Japanese types than is the Filipino Iberian with the other Filipino types, because in the latter the Iberian is more recent and is also found unmixed and pure in type, as among the Castilian Spanish. The Iberian probably predominates in the Japanese but it does not in the Filipino.

The stature of the women is less (7.2 per cent) than that of the men, but it is about the usual percentage less, and is not greater than it should be as it is among the Igorots. This again is an argument for the homogeneity of the types in the four groups. The difference between the Students and the Morgue subjects may be due to nurture, the former being well nourished and the latter poorly nourished. All of the differences in stature could be accounted for by modifications due to environment, but it is better to find the true explanation than to ascribe the differences to unknown causes. The type is justified also if the group differences can be explained.

Cephalic index of the Iberian type.

No.	Group.	Sex.	Index.
5	Malecon Morgue	♂	76.65
8	do	♀	77.92
5	Japanese	♂	74.14
25	Manila Students	♂	75.20

The heads of this type are moderately dolichocephalic, except those of the women, which are slightly mesocephalic. The morgue subjects have a higher index than the Japanese or the Students, and the women have the highest index. The Japanese have longer, narrower heads than any of the others, which indicates a condition nearly like the original Iberian type. The cephalic index is considered to be one of the best criteria of type, but this must be taken with reservations because of innate abnormalities of the skull and by reason of extraneous influences. The heads of many Filipinos are undoubtedly distorted in infancy by resting on hard substances covered only with the *petate*. This distortion may be counteracted by the later growth of the individual, but it is probably retained to some extent in the adult. Many heads show the dorsal flattening that has been supposed to be characteristic of the East, but it is probably only the retention of this infantile condition.

Nasal index of the Iberian type.

No.	Group.	Sex.	Index.
5	Malecon Morgue	♂	68.14
8	do	♀	69.80
5	Japanese	♂	76.92
25	Manila Students	♂	73.90

The nasal index is probably more reliable than the cephalic index as a differential factor in the racial anatomy of a people, although it is not so accurate on the living as on the skull, because of different methods of measurement used by different observers, and of greater liability to errors of technique. However, the nasal index, although slightly less for the Morgue subjects than for the Japanese and Students, is practically homogeneous for the four groups.

The stature, the cephalic index and the nasal index establish the Iberian type as a homogeneous entity which is found among Filipinos of extremely different culture levels and among the Japanese. There are also other characters that are homogeneous and that differentiate the Iberian from the other types, which characters will now be given.

Morphologic face index of the Iberian type (relative face height).

No.	Group.	Sex.	Index.
5	Malecon Morgue	♂	79.90
8	do	♀	81.53
5	Japanese	♂	78.32
25	Manila Students	♂	86.40

This index represents the distance from chin to nasion divided by the greatest interzygomatic distance, and expresses the face height relatively; therefore, it may be said that the face height of students of the Iberian type is greater than that of the other groups, and least in the Japanese. The Morgue males are practically the same as the Japanese. There is no great disharmony among the groups, and the face, although not so long and narrow as the original Iberian type of Europe, is longer and narrower than that of the other types to be considered.

Brachial index of the Iberian type.

No.	Group.	Sex.	Index.
5	Malecon Morgue	♂	77.60
8	do	♀	76.13
5	Japanese	♂	65.52

The brachial index, which represents the length of the forearm in terms of the upper arm as 100, is much less for the Japanese than for the Morgue subjects. The difference noted may be due to locality or nationality rather than to type. The Japanese measured have short forearms and long upper arms, which is characteristic of the Iberian in contrast with other types presently to be discussed. The men and women have nearly the same index.

Crural index of the Iberian type.

No.	Group.	Sex.	Index.
1	Malecon Morgue	♂	100.00 (?)
8	do	♀	93.55
5	Japanese	♂	97.53

The crural index, which represents the length of the lower leg in terms of the upper leg as 100, is less than 100 for the Iberian type, and it is less for the women than for the men.

Shoulder-hip index of the Iberian type.

No.	Group.	Sex.	Index.
5	Malecon Morgue	♂	83.36
8	do	♀	89.65
5	Japanese	♂	74.05

The relative width of the hip in terms of the shoulder width as 100, which is represented in the table above, may not be so good a differential character as those mentioned before this, but it has its merits. By this index the Japanese Iberians have both relatively narrow hips and relatively wide shoulders. The hips of the women are relatively wider than those of the men.

THE PRIMITIVE TYPE.

This type has features in direct contrast with the Iberian. The latter has medium stature, long head, long nose, long face, long hands, and short forearms and lower legs; the former has small stature, wide head, wide nose, wide face, short hands and long forearms and lower legs.

The cephalic index of the Primitive type.

No.	Group.	Sex.	Index.
8	Malecon Morgue	♂	89.10
4	do	♀	89.57
8	Igorots	♂	84.30
9	Manila Students	♂	85.50

The cephalic index of the Igorots and Manila Students is less than that of the Morgue subjects, although the index of all is brachycephalic. The head of the Morgue women is exactly the same in cephalic index as that of the Morgue men.

The stature of the Primitive type.

No.	Group.	Sex.	Stature.
7	Malecon Morgue	♂	152.5
4	do	♀	146.3
8	Igorots	♂	150.3
9	Manila Students	♂	150.8

Stature is one of the most distinct characteristics of the Primitive, because it is so much less than that of any other type. The stature of the Primitive is relatively less for the Students and Igorots and greater for the Morgue subjects than is that of the Iberian; and the stature of the Primitive women, relative to the stature of the Primitive men, is 3.1 per cent greater than that of the Iberian women.

The nasal index of the Primitive type.

No.	Group.	Sex.	Index.
8	Malecon Morgue	♂	90.42
4	do	♀	101.08
8	Igorots	♂	89.40
9	Manila Students	♂	86.50

The Primitive is platyrrhine in all the groups, and the women are more platyrrhine than the men. This is not true of the Iberian, although the Morgue women are more platyrrhine than the Morgue men of that type. The relation of the Morgue to the School is the reverse for the Primitive as compared with the Iberian. The latter type among the Students has wider noses, whereas the former has narrower noses, relatively speaking. Is this an indication of the Galton-Pearson law of regression toward the mean, or does it indicate greater blending of nose types among the students? Probably the latter.

The morphologic face index of the Primitive type.

No.	Group.	Sex.	Index.
7	Malecon Morgue	♂	75.6
4	do	♀	73.1
9	Manila Students	♂	78.8

This index is almost 10 less than for the Iberian, and the same relative difference exists between the Morgue subjects and the Students for this type as for the Iberian, which is that the face of the student is relatively longer compared with the width, than is that of the Morgue subjects. The female Primitive is 3 less than the male, whereas the female Iberian is about 2 greater; but with so few individuals a slight difference may not be significant.

The brachial index of the Primitive type.

No.	Group.	Sex.	Index.
8	Malecon Morgue	♂	81.4
4	do	♀	81.3
8	Igorots	♂	80.0

The index for the Primitive Morgue male is 4 points higher than for the Iberian male, and for the Primitive Morgue female 5 points higher than for the Iberian female; and that of the Primitive type of the Igorots is 14.5 greater than that of the Japanese Iberian. This indicates a longer forearm and shorter upper arm for the Primitive than for the Iberian. The difference in brachial index between the Iberian and Primitive types is not so great, however, as that of the crural index which follows, although this index can be presented only for the Morgue subjects.

The crural index of the Primitive type.

No.	Group.	Sex.	Index.
7	Malecon Morgue	♂	106.1
3	do	♀	102.0

The lower leg of the Primitive is longer than the upper leg, and the character is more marked among the men than among the women. This is one of the most characteristic features of the Primitive type and differentiates it from all others, except the Australoid, which is similar to the Primitive but has not quite so high an index.

The shoulder-hip index of the Primitive type.

No.	Group.	Sex.	Index.
7	Malecon Morgue	♂	79.3
4	do	♀	85.0

The hip breadth of the Primitive is less than that of the Iberian relative to shoulder breadth, and that of the women is greater than that of the men. The actual shoulder breadth of the Iberian and Primitive is the same; therefore the hip index expresses actual hip breadth in percentages. This indicates that the Primitive has a narrow pelvis, whereas the pelvis of the Iberian is broad. Is broad pelvis associated with long head, and narrow pelvis with round head? (Lapicque.)

THE AUSTRALOID TYPE.

The characteristics of this type, in contrast with the Iberian and Primitive, represent an intermediate condition, or a condition similar to one or the other of the two types, facts that will be disclosed as the study advances.

The stature of the Australoid type—averages.

No.	Group.	Sex.	Stature.
5	Malecon Morgue	♂	158.80
3	do	♀	148.30
9	Igorots	♂	146.60
2	Japanese	♂	163.85
30	Students	♂	161.00

The stature of the Australoid is practically uniform in all the groups except the Igorots, which has a stature less than the Morgue females Only one student has a stature as low as that of the average Australoid Igorot. The Igorots, however, were selected by a method which differs from that used in the selection of the other Australoids, and by this method those with greater stature are admitted to the other groups, but not to the Igorots. If Igorot types are selected in the same way as are student types, the number of Igorot Australoids is brought from 9 up to 45; and the average stature of the group is also increased thereby. The smallest student is about 1 centimeter taller than the average of the 9 Australoid Igorots, however, and this indicates that the student Australoid is different in stature from the Igorot Australoid. The difference is probably due to recent Iberian in the students. The Igorots may represent a remote cross of the Primitive and Iberian, whereas the Students represent a recent cross, and a few of the remote cross still persist among the Students.

The stature of the men is less throughout than that of the Iberian type, except the Japanese who are 2.5 centimeters greater for the Australoid than for the Iberian. Judged by the stature alone, the Australoid men are more like the Iberian, whereas the Australoid women are more like the Primitive.

The cephalic index of the Australoid type.

No.	Group.	Sex.	Index.
5	Malecon Morgue	♂	76.74
3	do	♀	78.95
9	Igorots	♂	75.10
2	Japanese	♂	77.32
30	Students	♂	76.80

Differences of cephalic index that are so slight as in the above table, may be due to modifications by local influences, habit, etc. The Igorots have the smallest index which may indicate greater purity of type than in the other groups. The index of the women, similar to that of the Iberian, is greater than that of the men. The index is slightly greater than that of the Iberian type, but is practically the same. The head of the Japanese is the largest, that of the Morgue the smallest, and the Student is between the two in head size. This is true also of the Iberian type.

The nasal index of the Australoid type.

No.	Group.	Sex.	Index.
5	Malecon Morgue	♂	96.4
3	do	♀	92.0
9	Igorots	♂	97.7
2	Japanese	♂	92.7
30	Students	♂	92.7

The index is greater for the Igorots and Morgue than for the other groups, which are all alike. The Igorots and Morgue subjects are probably purer than the others as already indicated by the stature and cephalic index, particularly of the Igorots. The nasal index of the women, unlike that of the Iberian and Primitive type, is less than that of the men, otherwise the nasal index of the Australoid is greater than that of the Primitive. There is not so much evidence of blending with the Iberian or Primitive in nose type as there is in stature and head form.

The morphologic face index of the Australoid type.

No.	Group.	Sex.	Index.
5	Malecon Morgue	♂	75.3
3	do	♀	77.1
2	Japanese	♂	79.5
30	Students	♂	81.1

This is practically identical for the Students and Japanese, but it is less for the Morgue subjects and in this way resembles the Iberian type.

The brachial index of the Australoid type.

No.	Group.	Sex.	Index.
5	Malecon Morgue	♂	80.0
3	do	♀	78.9
9	Igorots	♂	75.1
2	Japanese	♂	62.6

The brachial index is discordant in the several groups and does not differentiate the Australoid from the other types so well as the crural index. The Japanese have a low index as in the other types. The index is less for the Igorots than for the Morgue subjects, as in the Primitive. The Igorot index is nearer the Iberian than the Primitive, whereas the Morgue subjects are nearer the Primitive than the Iberian. The brachial index may be a group differentiator rather than a differentiator of type.

The crural index of the Australoid type.

No.	Group.	Sex.	Index.
5	Malecon Morgue	♂	101.1
3	do	♀	106.0
2	Japanese	♂	106.0

The crural index of the Morgue males of this type is not essentially different from that of the Iberian type, although it is 2 points nearer the Primitive than is the Iberian. The Japanese and the Morgue females have an identical relation to each other in the Australoid and Iberian types, and the Primitive Morgue male is intermediate between the two, in relation to both type and group.

The shoulder-hip index of the Australoid type.

No.	Group.	Sex.	Index.
5	Malecon Morgue	♂	82.6
3	do	♀	83.2
2	Japanese	♂	71.6

The index of the men is midway between that of the Iberian and Primitive. The small index of the Japanese and of the women is due to the wide shoulders.

Differential factors of the Iberian, Primitive and Australoid types—adult males.

Characters.	Iberian.	Primitive.	Australoid.
Stature	163.8	151.1	158.1
Cephalic index	75.3	86.4	76.5
Nasal index	73.5	88.7	93.9
Morphologic face index	81.3	77.7	80.2
Brachial index	71.6	80.7	75.1
Crural index	98.6	107.1	102.5
Hip-shoulder index[a]	83.4	79.3	82.6
Intermembral index	73.7	72.0	70.3

[a] Morgue subjects only.

This table includes the Igorots, Japanese, Manila Students and Morgue males measured by me, and the numbers given are the averages for all the individuals of the groups that were measured. The Primitive type is not found among the 10 Japanese, but it would no doubt be found if a larger number were measured.

The Filipino Iberian is not exactly the same as the Mediterranean Race of Sergi, but is really a Spanish-Filipino Mestizo. Two distinct color markings are noted: one is a dark skinned, almost black individual, much darker than the average Filipino; the other is almost white and looks more like a European than a Filipino. The former may be the Indian-Filipino mestizo, and the latter the Spanish-Filipino mestizo; or, if this be not true, then the pigment of Iberian and Filipino react according to Mendel's laws, being intensified in the one and decreased in the other. The Iberian is a remarkably pure type, and, in spite of crossing with the Filipino, remains almost pure especially in the characters given above.

The Primitive type is also pure and probably remains so, but the evidence of crossing can not be positively known as it may be for the Iberian. The two types are extremely different, and more distinct than any other types as evinced by the differences. The origin of the Primitive can not be located with certainty although accumulated evidence points to the Negrito as at least a closely related type. However, either one or both may be only primitive forms due to retarded development. The stature of the Primitive is small, the head is small and round, the nose and face are broad, short and flat. These infantile characters and possibly others, may mean only stunted growth, but, whatever the cause, the type is none the less a true type. Its distribution among Igorots, Students and Morgue subjects indicates that it forms a part of all the Filipino population. If it is the same as the Negrito, with straight instead of kinky hair, as it certainly is by physical measurements, then it is present in many of the Pacific Islands as well.

The Australoid is nearly the same as the Iberian in stature, cephalic index, brachial index and shoulder index; it is nearly the same as the Primitive in nasal index and morphologic face index, and it is intermediate between the two in crural index. The nasal index is the only character that is not between the Iberian and Primitive, and this is the most characteristic trait of the Australoid. The evidence so far accumulated points directly to the Australoid as a cross between the Iberian and Primitive. The stature of the Igorot Australoid is, however, less than that of the other Australoids, and the nasal index is greater. This is probably the ultimate end result of the blending process. The others are more recent blends and, in time, would be like the Igorots under the same conditions.

OMPHALIC INDEX.

This index can not be determined exactly because the height of the pubis was not measured, but the height of the trochanter may be substituted for it. This will not show such a distinctive difference, because the pubis is probably lower in the Primitive than in the Iberian type. However, there is a difference. The Iberian index, using the trochanter instead of the pubis, is 40, and the Primitive index is 43.1: This difference is similar to that between the Bontoc and Lowland Igorots, the Iberian and Bontoc being alike, and the Primitive and Lowland alike. It also places the Primitive nearer the women than is any other type.

II. REMAINING TYPES.

There are so few individuals to represent the remaining types that they are all discussed together. The Cro-Magnon, B. B. B., Alpine, and Adriatic are placed in the table which follows, and the Iberian and Blend alongside, in order that each may be compared with the other. A glance along the columns of this table will reveal very slight differences between the types of the Students and of the Morgue subjects, a fact that argues for the verity of the types.

TABLE I.

Character.	Iberian.		Alpine.		B. B. B.		Adriatic.		Cro-Magnon.		Blend.	
	Morgue.	Student.	Japanese.	Student.	Morgue.	Student.	Morgue.	Student.	Morgue.	Student.	Morgue.	Student.
Stature	163.4	164.3	160.0	160.2	166.3	168.8	165.0	168.6	173.0	170.0	159.8	163.8
Cephalic index	76.6	75.2	84.6	86.9	82.4	86.2	85.0	88.0	74.6	80.5	82.5	82.4
Nasal index	68.1	73.9	65.4	72.9	65.7	72.0	100.0	92.9	92.1	80.6	83.2	84.8
Morphologic face index	79.9	86.4	83.3	83.0	81.0	82.9	82.1	78.4	86.4	82.6	80.0	82.4
Brachial index	71.6	------	76.6	------	74.7	------	79.7	------	78.6	------	77.2	------
Crural index	98.6	------	85.0	------	90.0	------	104.0	------	99.2	------	95.2	------
Intermembral index	73.2	------	69.8	------	68.1	------	70.3	------	70.6	------	71.3	------
Ear index	58.3	------	63.3	------	61.3	------	54.6	------	58.9	------	59.6	------

THE ALPINE AND B. B. B. TYPES.

The characteristics of the Alpine type are stature below the average, brachycepalic head, leptorhine nose, short lower legs, relatively wide ears and short upper extremities. It is more like the blend than any other type, and is almost identical with the B. B. B. except in stature, which was arbitrarily chosen. Both have the highest ear index of all types, the lowest intermembral index of all types, the lowest brachial index except that of the Iberian, and the lowest nasal index of all types It must be remembered, too, that there is only one Japanese Alpine, and only three B. B. B. Morgue subjects; therefore, the close approximation of these to the 30 Alpine students and 21 B. B. B. students is remarkable and emphasizes the types as real entities. The differences between the Alpine and B. B. B. types are not so great in the characters measured as in the characters observed, such as the square head of the B. B. B. and the round head of the Alpine, the square ear of the B. B. B. and the round ear of the Alpine, and the general stocky build of the B. B. B. and the rotundity of the Alpine, although the head of the student B. B. B. is 5 millimeters longer and 3 millimeters wider than that of the Alpine, and the head circumferences of the B. B. B. are all larger. The face of the Student B. B. B. is 4 millimeters longer and 3 millimeters wider than the face of the Alpine, and the nose is 2 millimeters longer and 1 millimeter wider. The cephalic index is less for the B. B. B. than for the Alpine. The two types would be classed as one if it were not for the differences mentioned, all of which are slight, however, and the separation may prove to be an arbitrary one. I have already expressed an opinion that the B. B. B. is the result of the union of the Alpine and Iberian with possibly Cro-Magnon elements, and I still persist in holding that opinion.

THE CRO-MAGNON TYPE.

This type is the tallest thus far encountered in the Philippines, and the cephalic index is the least of all the types from the Morgue. The nasal index is high, the morphologic face index is also high, as well as the brachial, crural, and intermembral indices. In other words, the head is long and narrow, the nose is short and wide, the face is long and relatively narrow and the forearms, lower legs, and upper extremities are relatively longer than those of the other types. The Cro-Magnon students are largely blended with the other types and partake only to a slight extent of the Cro-Magnon characteristics, as may be seen by reference to the table above, and as expressed in the paper on Manila Students.

The Cro-Magnon resembles the Australoid in cephalic index, nasal index and other characteristics, but is distinctly different in stature, the Australoid being the smallest of all types, and the Cro-Magnon the tallest. A relation between the two, similar to that which exists between the B. B. B. and Alpine, may be true, but the relationship is not so intimate.

THE ADRIATIC TYPE.

This type is tall and has broad head, face, and nose. The other characters are not distinctive, although the forearm and lower leg are rather long. The Adriatic is an enlarged reproduction of the Primitive type, but it is as far removed from the latter as the Cro-Magnon is from the Australoid. The Chinese element of the Adriatic may account in part for the difference.

SUMMARY.

I would suggest that the Adriatic and Primitive are derived from one source, and that the Cro-Magnon and Australoid are derived from one source, but the two sources are not the same. Transferred to Europe from the south of Asia or some other part of the East in prehistoric times, the Primitive and Australoid may have evolved there the Adriatic and Cro-Magnon in much the same way that Sergi accounts for the evolution of the Nordic type from the early Mediterranean Race, the Iberian type. The Sarasin brothers and Martin have found in Ceylon, in the Celebes and in the Malay Peninsula, and others have also found elsewhere, a type closely simulating the Australoid, and they look upon this type as one of the primary types of men from which have sprung many races. The work that I have done adds its mite toward that hypothesis, and illustrates in a more definite way some of the types that may have resulted from this primitive precursor. I believe, however, that my work also demonstrates another type which I call Primitive, that is antecedent to the Australoid and has helped to produce the Australoid by its blending in a disharmonious manner with the Iberian, the latter having probably disappeared in other parts of the East as it has from among the Igorots. The objection to the types selected may be that too few individuals were observed, and if 1,000 individuals had been measured, at least some of the types would fuse by closing of gaps between them with intermediate forms that are necessarily absent when so few are considered. For instance, I have demonstrated the similarity of the Primitive, Modified Primitive and Adriatic, of the Alpine and B. B. B., and of the Australoid and the Cro-Magnon. There are gaps between the types among the Students as well as among the Morgue subjects, but if a larger number were measured these gaps might be bridged over. If this be true, then the types selected represent cross sections of variable species, and this is additional proof that the types are elementary species, and probably represent the separation and segregation by variation and modification of new elementary species of man.

III. HEAD OUTLINES.

Lead fuse wire was used for making three contours of the head in the same way that similar contours were made of the Igorots and of the students of the University of Michigan. Representative outlines of each type are selected for comparison. None of the female Primitive or Australoid head outlines were taken, but the female Iberian and Alpine are presented.

The head of the Alpine woman is almost identical in size and shape with the head of the Primitive man. Both show dorsal flattening and the woman's forehead is characteristic of the female. The head of the woman is distorted behind, which gives a bulging appearance at one side of the horizontal outline. The similarity of the Alpine and Primitive head outlines indicates a close relationship between the two types.

When these outlines are compared with those of the Iberian type a great contrast is observed. Whereas the Primitive is short and broad, the Iberian is long and narrow. The female Iberian outline is smaller than the male, and the Japanese is longer and not so high as the Filipino. The shape of the three Iberian head outlines is similar, each presenting the square vertical forehead and the projecting occiput, so characteristic of the Iberian. There is no appreciable flattening of the dorsum of the head except that of the woman, which may not really be flattened, but exhibits a sloping plane in the rear as noticed to some extent in the Japanese and Filipino male, but at a different angle. The Japanese has a slight indication of scaphocephaly noted by the prominent sagittal eminence of the coronal outline.

The Japanese and Filipino Australoid are almost identical except that the Japanese is longer and not so high, a characteristic that holds true for all the Japanese types. This is similar to the American student; and the Filipino resembles the Igorot by contrast with the Japanese. The Australoid is unlike the Iberian or the Primitive, but resembles the former more than the latter. The head is long, narrow and oval. The forehead is vertical but not square and the occiput does not bulge nor is it flat. The lines of the head look as if the Iberian had been changed only slightly in being rounded off by the Primitive. The Igorot Australoid (type A) head outline is almost identical with that of the outline of the Australoid herewith presented.

The head outline of the Blend of both Japanese and Iberian represents a composite with characteristics resembling different types, and its blended appearance speaks for itself.

The Cro-Magnon Filipino is placed with the Chinese Blend for comparison and contrast. The shape of the two is not greatly unlike except in the frontal region. The Chinese has a sloping head, whereas the forehead of the Cro-Magnon is vertical or bulging. The other characteristics of the European Cro-Magnon are present to some extent. The difference in size between the two individuals is a matter of no great significance, because a Chinaman with a large head and a Filipino with a small head could be found easily.

Further comment on the head outlines is unnecessary, because they are graphic representations and words are inadequate to describe them. Outlines made in the manner of these should be taken with reservations, because they can not be made to conform exactly to the head, and they may be slightly distorted by handling before they are transferred to paper. However, I believe they represent in a fairly accurate way the general contours of the head, and they can be easily taken. As the lead fuse wire is convenient for transportation, the method should be utilized by careful investigators. I have devised a head machine which will be perfected shortly, and with it exact outlines can be made in any direction over any part of the head and face. A description of the head machine, with photographs, is soon to be published.

IV. AMPLIFIED SCHEME FOR HEREDITY.

The relative number of each type is given in the following table of percentages:

Relative number of adult male individuals of the various types in the different groups.

Type.	Primitive.	Australoid.	Iberian.	Modified Primitive.	Alpine.	B. B. B.	Adriatic.	Cro-Magnon.	Blend.
Malecon Morgue	16.6	10.4	10.4	2.0	2.0	6.3	2.0	6.3	43.8
Manila Students	2.4	8.0	6.6	12.2	8.0	5.6	6.4	....	50.0
Igorots	8.0	9.0	....	....	....	8.0	....	....	75.0
Japanese	?	20.0	50.0	....	10.0	....	....	....	20.0

Malecon Morgue receives a larger proportion of the Primitive, Australoid, Iberian and Cro-Magnon types than is found among the Igorots or the Students, and there are fewer Modified Primitive, Alpine, Adriatic and Blends than among the Students.

The Japanese are too few to draw conclusions from, but it is of interest to note the Australoid, Iberian, and Alpine types among them, the large percentage of Iberians being especially significant.

When the above table is taken in connection with the scheme for heredity herewith reproduced and amplified, one may calculate, somewhat inexactly, the relative condition of amalgamation represented by each group of measured individuals. The calculation is somewhat inexact because of many unknown factors. If only two pure types are concerned, the calculation would be almost exact in representation of the degree of amalgamation of the two types by interbreeding; but more than two types have mingled in each group; the types have not been pure, i. e., perfect blends, or homozygotes of Mendelian characters; and the minglings, re-minglings, crosses and re-crosses have been many and varied. In spite of these disturbing factors, the degree of homogeneity of the population, or the condition of amalgamation, or the extent of the blending process, may be determined approximately. We will consider first the readjusted scheme for heredity, then calculate the degree of mixture of each group in relation to it.

AMPLIFIED SCHEME FOR HEREDITY.

In the scheme for heredity *D* and *R* represent the homozygotes of an allelomorphic pair that meet at 1 in sexual union, begin to blend at 2, present the picture of a variable blend at 3, and fuse completely into a perfect blend at 4. A horizontal cross section of the diagram at any point represents the relative number of individuals of the different kinds present at that time in the process of amalgamation, provided procreation has been continuous and always with the same relative increase in numbers. The width of the diagram, exclusive of the spaces B^3, also indicates the amount of variation at any time. D=homozygous dominants; R=homozygous recessives; DR=heterozygotes; B^1 (inside the solid lines)=a variable blend ever increasing in number with each successive generation; while D, R, and DR decrease to disappear entirely at 3. B^2 (inside the solid lines) represents the continuation of the blend without either of the originals of the allelomorphic pair, but with all shades of intervening characters blending in various ways as influenced by ancestry and by environment, until a homozygote is formed at 4. B^3 (inside the solid lines) represents the increasing purity of the blend until at 4 a perfect blend or an elementary species is formed.

From 1 to 2 True Mendelism exists, Spurious Mendelism is found from 2 to 3, and from 3 to 4 No Mendelism is present, but two tendencies prevail: (a) the reversion to type, and (b) the tendency to blend.

This scheme represents the individual characters but it may also apply to the type composite, although some characters may not follow the scheme but exhibit blending at once when crossed, without intervening Mendelism. Therefore some characters should be represented in one part of the scheme while others are represented in other parts. In types with extremely divergent characters, such as the black and white coat in guinea pigs, Mendelism may persist as indicated in the scheme; whereas if the types that cross are similar, the result may be a more or less perfect blend immediately. The Mendelism is overleaped and the types pass at once into the conditions represented between 3 and 4, or that of a variable blend with No Mendelism.

The ultimate result of a process where many types are blending will depend upon many factors such as environment, natural and sexual selection, the relative number of each type which enters into the amalgamated product, the dominance of one type over another, the time during which amalgamation has taken place, etc.; and the elementary species formed may be unlike the original types, yet not a perfect blend. (For example, the Australoid, as a result of crossing the Iberian and the Primitive.) The calculation may now proceed. The relative number of blends in proportion to the number of types is to be considered, also the number of each type present, and finally the condition of the types as to purity.

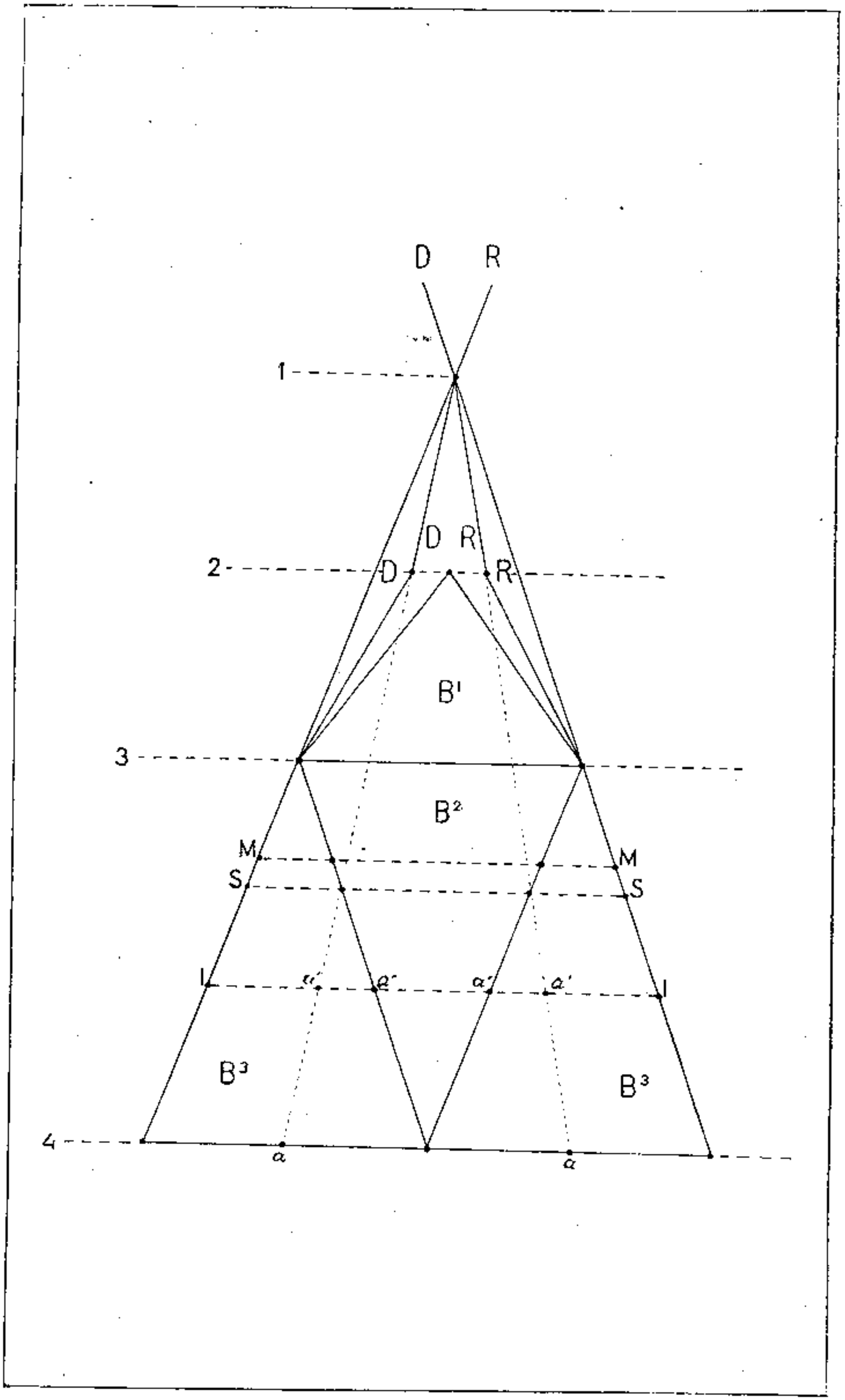

Diagram Representing Scheme for Heredity.

The greatest number of blends is represented among the Igorots, the least among the Japanese, which would indicate that the Igorots are more completely amalgamated than the Japanese, but there are too few Japanese from which to draw conclusions.

A review of the blends of the Igorots, using the methods adopted for selecting the Student and Morgue types, reveals 8 that resemble the Iberian type, and 70 that resemble the Australoid, which would reduce the number of blends and increase the other types accordingly. There are undoubtedly traces of the Iberian among the Igorots, and a careful inspection of the frontispiece of the work on the Benguet Igorots,[1] Plates I, II and III, reveal Iberian characteristics. The ears of the Igorot portrayed there are Iberian type *b*.

The Igorots evidently have more Australoids than previously designated, and a few Iberians, but they are not so pure as those originally selected, and should be classed as blends. If we accept these additional Australoids and Iberians, the Igorots are not so completely amalgamated as the Students and Morgue subjects, but they should not be classed with the types because they are manifestly impure, and are only blends that resemble Australoid and Iberian more than any other types. The Student Australoid represents both recent and remote Iberian and Primitive amalgamated, whereas the Igorot Australoid represents only the remote Iberian and Primitive amalgamated. The Igorots, therefore, are the most completely amalgamated of the three Philippine groups, and the Students are more amalgamated than the Morgue subjects. This is determined by the relative proportion of the blends without reference to the purity of the types. The latter will now be considered.

The types selected from among the Igorots show resemblances to European and Negrito, but they are not pure types, and one type, the Australoid (type A), is distinct and represents a new type, the result of the disharmonic union of the Iberian and the Primitive. This is additional evidence in favor of the nearly complete amalgamation of the types that make the Igorot. The presence of the Australoid blends in so large a proportion among the Igorot blends necessitates an elaboration of the scheme for heredity to indicate that one-half of the blends are Australoid, the other half being divided among the individuals that resemble the Iberian, type M and type N, besides those that may be perfect blends. The Australoid type is represented outside the broken lines a–a in the scheme for heredity, and a correct representation of the relative proportion of the Australoid comprises one-half of the population, which is probably true. This complicates the scheme, but the following explanation may clarify it somewhat. The broken line I–I represents the position of the Igorots. Between I and a^1 are the Australoids which are relatively pure blends. Between a′ and a″ are the other relatively pure blends. Between a″ and a″ are the impure or variable blends (represented by type M and A and the Iberian). If at any time, by reason of certain conditions, one type increases in numbers more rapidly than another, then the relative proportion which at present exists will be altered. The Australoid now predominates, and if it was not previously present in equal numbers with all the other types, then it is increasing more rapidly than the other types. Among the Japanese the types selected are not pure, but there is a general resemblance among them in such characters as face width, stature, upper arm length, and hip-shoulder index, in which they differ from the other groups. The small number of blends is therefore counterbalanced by the homogeneity of the individuals to such an extent that all the Japanese may be considered as blends, and the types merely resemble their prototypes of the other groups. In consideration of this and because of the small number of individuals who are all from the same culture level, the Japanese are omitted from the scheme for heredity.

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[1] *This Journal Sec. A.* (1908) **3**. 413.

The Manila Students are composed of at least three comparatively pure types: Iberian, Primitive, and Australoid, and of several other types that are not so definite: the Alpine, B. B. B., Modified Primitive, Cro-Magnon, and Adriatic. The purest of types are the Iberian and Primitive, the Iberian the purest of all, the Australoid not so pure because it is a mixture of the two, a mixture that has had two successive stages: one remote in time and one recent; the former well represented by the Igorots, the latter better by the Students, which naturally makes the type more variable than the two of which it is composed, they having remained constant in physical characteristics through time and space where not mixed with other types. However, if the types are considered in connection with the blends, there is an equal number of the two (types and blends), and the line S–S would represent the position of the Student in the scheme for heredity if we omit the Iberian, which must be placed above 3 because of its evident purity. It can not be located exactly, but I believe it will exhibit Spurious Mendelism between 2 and 3, and probably in some characters it will exhibit True Mendelism which would place it between 1 and 2.

If the Primitive is a pure type, and if it has not changed its form (does not represent the Negrito undergoing metamorphosis) throughout its existence, it must be placed in a position very near that of the Iberian; but if it is a modified Negrito, the type is not so pure as the Iberian, the loss of kinky hair indicating metamorphosis, and it may be placed with the other types in B^2 between 3 and 4.

The Morgue subjects are in a condition of amalgamation similar to that of the Students, although the actual number of blends which would place them at M–M is less. Here again, as among the Students, the

Iberian and Primitive types, if pure, would alter the position, placing the group in Spurious or Pure Mendelism instead of in No Mendelism. The real condition of both Students and Morgue subjects is probably this: the Iberian and the Primitive types, with the Australoid and their blends, are in a condition of Spurious or Pure Mendelism between 1 and 3, whereas the other types and their blends are in a condition of No Mendelism between 3 and 4, yet above the position of the Igorots. The Cro-Magnon and its blends are nearer the Igorot than any other, and may be more advanced toward complete amalgamation than any type, even beyond the condition of the Igorots.

To summarize: The Japanese are too few in number to justify generalizations, although they are probably in a condition of No Mendelism. The Igorots are in a condition of No Mendelism and by actual calculation they are nearer 4 than 3, but by reason of the presence of certain types that approach purity they may be nearer 3 than 4. The Manila Students and the Malecon Morgue subjects indicate at least three and probably four stages of blending present at the same time: first, the Iberian with its blend is in a condition of True and Spurious Mendelism; second, the Primitive and the recent Australoid with their blends are in a similar condition or one of Spurious Mendelism; third, the remaining selected types with their blends, judging by their similarity to the Primitive and to each other, may never have passed through a condition of Mendelism, but entered immediately into an imperfectly blended condition of No Mendelism near 3; finally the Cro-Magnon and other elements are so firmly fused as to be almost perfect blends and are represented by No Mendelism near 4.

The following inferences may be drawn from the previous representations: The Cro-Magnon and earlier forms first entered into a fusion that started at a time remote from the present. This was followed by a union of the Primitive and Iberian which formed the Australoid, and the three types with their blends joined the Cro-Magnon and earlier forms with their blends. At a still later time, some of the other types and their blends with the Primitive and Australoid joined the fusing types mentioned before, the result of this at present being the Igorots and other people of the interior. Continuous infusions of the other types and their blends with the Primitive and Australoid, and the minglings of all these elements in a disorderly way, resulted in the mixed population of the lowlands or the littoral Filipinos. The Chinese have been almost continuously entering the Philippines, and their types, the Iberian, Cro-Magnon, Alpine, B. B. B., and Adriatic, which are but modified Europeans, have fused with the others. The more recent occupation of the Archipelago has brought the pure Iberian and its blends with the Alpine, B. B. B., and Adriatic, as well as some Cro-Magnon blends into contact with the littoral people, and the Manila Students and

Morgue subjects represent random samples in two small selected strata of this composite population. Even though all European types originated primarily by the union of two divergent forms similar to the Nordic type of Denniker and the Primitive type herein described, yet the above inferences need not be vitiated thereby because the types of Europe had become distinct by isolation, etc., before penetrating the East, and all of these may not have reached the Pacific in the successive waves of migration eastward.

IV. GROUP AVERAGES.

Each measured character will now be examined by averages for the whole of each group, beginning with stature:

Stature.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
47	♂	Malecon Morgue	148.0	160.5	174.0
10	♂	Japanese	153.5	161.7	171.0
377	♂	Manila Students	146.0	163.3	178.0
104	♂	Igorots	135.0	154.0	170.0
22	♀	Malecon Morgue	142.0	151.0	161.0
10	♀	Igorots	142.0	146.7	151.0

The stature of the Students exceeds that of any other group, which may be interpreted in terms of better nurture, or of mestizo blood, or of both, probably the last. The stature of the Igorots is less than that of any other group, and is probably due to the predominance of the Australoid and Primitive types, although nurture may play a part. The Japanese are taller than the Igorots, because they have a greater proportion of European blood (Iberian, Alpine, etc.), for here nurture could hardly exert a different influence on the two groups, although it may have. The Malecon Morgue group has a greater stature than the Igorots for the same reason. They are undoubtedly a poorly nourished group, yet their nurture has not reduced the stature to that of the Igorots. Generalizations such as those just given may not be justified when so few individuals are under consideration, but the indications point strongly to the inferences stated.

Cephalic index of the head—not the skull index.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
46	♂	Malecon Morgue	72.19	81.99	92.85
10	♂	Japanese	71.3	77.65	84.6
377	♂	Manila Students	72.0	82.1	98.0
104	♂	Igorots	71.7	77.6	86.0
21	♀	Malecon Morgue	75.0	81.85	90.6
10	♀	Igorots	71.0	77.5	81.0

The Igorots and the Japanese are so nearly identical in cephalic index that they must be related peoples if head form is a criterion of type, and at the present time it is one of the best criteria in use. The presence of the Iberian and Australoid types, which have similar head forms among both the Japanese and Igorots, readily accounts for the relationship. The Morgue and the Student groups have almost identical cephalic indices, and their heads are wider than the others. This is no doubt due to a great preponderance of the Primitive, Modified Primitive, Alpine, B. B. B., and Adriatic among the littoral Filipinos. Nurture could hardly exert an influence on head form, but distortion by the sleeping position in infancy and childhood should be considered as a factor, especially in extreme brachycephaly. There are, however, broad heads with no apparent distortion; therefore distortion will not account for all broadheadedness.

Head length.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
16	♂	Malecon Morgue	15.8	17.9	20.5
10	♂	Japanese	17.5	19.1	20.6
377	♂	Manila Students	16.3	18.1	20.5
104	♂	Igorots	16.9	18.8	20.4
21	♀	Malecon Morgue	16.3	17.5	18.6
10	♀	Igorots	17.5	18.2	19.2

The head length conforms to the cephalic index in that the long headed Japanese and Igorots are mesocephalic, and the shorter headed Morgue and Students are brachycephalic. The Japanese have the longest heads, although they are not much longer than the Igorots. The range of variation is greater for the Morgue males than for any other group as indicated by the minimum and maximum head length. The shortest head occurs among the male Morgue subjects, the longest among the Japanese.

Head breadth.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
16	♂	Malecon Morgue	13.4	14.7	16.0
10	♂	Japanese	14.2	14.8	15.6
377	♂	Manila students	13.8	15.4	16.9
101	♂	Igorots	13.4	14.6	15.9
21	♀	Malecon Morgue	13.2	14.3	16.4
10	♀	Igorots	13.7	14.1	14.4

The broadest heads are found among the Students and the narrowest among the Igorots, although the Japanese and Morgue subjects are but little broader than the Igorots. The narrowest head occurs among the female Morgue subjects, and the broadest among the Students. The female Morgue subjects have the greatest relative range of variation in head breadth as indicated by the minimum and maximum, but the Students have absolutely the greatest range of variation, which they should have because of the greater number of individuals under consideration. Both the head length and the head breadth of the Students are greater than that of the Morgue subjects, therefore the Students have larger heads than the Morgue subjects. The Igorot head is about the size of the Students but is longer and not so broad. The Japanese head is a great deal longer than and almost as broad as the Students. The female head is smaller than that of the male in both dimensions.

Nasal index.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
46	♂	Malecon Morgue	55.1	84.4	110.0
10	♂	Japanese	64.0	80.7	100.0
377	♂	Manila Students	60.0	82.6	105.0
104	♂	Igorots	72.0	92.7	115.0
22	♀	Malecon Morgue	66.0	83.1	133.0
10	♀	Igorots	88.0	95.5	109.0

The high nasal index is largely confined to the Igorots, although the Morgue has a higher index than the Students or the Japanese. Nurture can have practically no influence on the nasal index, hence this is a good criterion of type. The female Igorots have a higher index than the male, whereas the female Morgue index is less than the male; therefore no conclusions are reached regarding the sexual relations of the nose. The Japanese have the least index, which indicates a greater proportion of European blood if we accept Risley's conclusions following a study of the castes in India. However, it may be only a greater proportion of Iberian in the Japanese which causes the low index, because the Iberian nose is narrower than the other European types, and the Iberian is present among the Japanese in a greater proportion than in the other groups, although the nose of the Japanese Iberian is wider than the Iberian type of the other groups. The greater proportion of Iberian among the female Morgue subjects may account for the nasal index being less with them than with the male Morgue subjects. The difference between the minimum and maximum indicates greater diversity of nose type among the female Morgue subjects.

Nose length.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
47	♂	Malecon Morgue	3.80	4.66	5.30
10	♂	Japanese	4.10	4.56	5.20
377	♂	Manila Students	3.60	4.56	5.80
104	♂	Igorots	3.20	4.10	4.80
22	♀	Malecon Morgue	3.30	4.44	5.50
10	♀	Igorots	3.60	3.80	4.10

The Morgue subjects have the longest noses, the Igorots the shortest, and the Japanese and Students are intermediate with noses of equal length. The noses of the women are not so long as those of the men.

Nose breadth.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
47	♂	Malecon Morgue	2.70	3.92	6.20
10	♂	Japanese	3.40	3.66	4.10
377	♂	Manila Students	2.90	3.76	4.50
104	♂	Igorots	3.20	3.80	4.60
22	♀	Malecon Morgue	2.80	3.60	4.10
10	♀	Igorots	3.30	3.63	4.00

The Morgue subjects have the broadest noses, followed by the Igorots, the Students and the Japanese in order of breadth, the Japanese having the narrowest noses. The greatest extent of variation is in the Morgue subjects, among whom the broadest and the narrowest nose is found. The women have narrower noses than the men, and the nose is smaller throughout. The Igorot women have wider noses than the Morgue women.

Head height.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
45	♂	Malecon Morgue	12.3	13.1	14.8
10	♂	Japanese	13.1	13.3	13.7
104	♂	Igorots	11.4	12.9	13.5
21	♀	Malecon Morgue	11.8	12.6	13.6
10	♀	Igorots	11.9	12.3	13.1
372	♂	Manila Students	12.1	13.1	13.9

The Japanese have the highest heads, and the Students and Morgue males come next with slightly less, the Igorots having the least height except the women. The highest head is that of a Morgue male, and the lowest that of an Igorot.

Minimal frontal diameter.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
42	♂	Malecon Morgue	9.1	10.4	11.8
10	♂	Japanese	10.1	10.8	11.6
101	♂	Igorots	9.3	10.3	11.5
21	♀	Malecon Morgue	8.8	10.0	10.9
10	♀	Igorots	9.7	10.3	11.0

The Japanese have the widest foreheads, and the Igorots the narrowest, except that the forehead of the female Morgue subjects is narrower than the Igorots. If this is compared with the maximum interzygomatic breadth, practically the same relation is true.

Interzygomatic breadth—(maximum).

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
41	♂	Malecon Morgue	12.6	13.8	14.6
10	♂	Japanese	13.0	14.4	15.1
104	♂	Igorots	12.2	13.6	14.9
21	♀	Malecon Morgue	12.3	13.1	15.6
10	♀	Igorots	12.0	13.1	13.6
372	♂	Manila Students	12.1	13.6	15.1

The face of the Japanese is considerably wider than that of the Igorots which is not so wide as the Morgue subjects, but the same as the Students. The face of the women is narrower than that of the men.

Nasion hair line.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
46	♂	Malecon Morgue	4.6	6.7	8.5
10	♂	Japanese	5.8	7.0	7.9
101	♂	Igorots	5.8	7.1	8.8
21	♀	Malecon Morgue	3.8	6.1	8.0
10	♀	Igorots	6.0	6.3	6.6

The Igorots have higher foreheads than the others, but they are almost equaled by the Japanese. The forehead height is less for the women than for the men.

Chin-nasion.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
46	♂	Malecon Morgue	9.2	11.0	13.0
10	♂	Japanese	11.0	11.8	13.0
101	♂	Igorots	9.4	10.8	12.0
21	♀	Malecon Morgue	7.2	10.2	11.4
10	♀	Igorots	9.8	10.3	11.0
372	♂	Manila Students	9.7	11.1	12.7

Morphologic face index.

No.	Sex.	Group.	Mean.
41	♂	Malecon Morgue	79.7
10	♂	Japanese	81.9
101	♂	Igorots	79.4
372	♂	Manila Students	81.6
21	♀	Malecon Morgue	77.8
10	♀	Igorots	78.7

The absolute face height (chin-nasion) and the relative face height (morphologic face index) are greater for the Japanese than for any other, the Manila Students being second and the Morgue male third in this factor. The Igorot males have the shortest face, although the Igorot females have a longer face than the Morgue females, who have the shortest face of all.

Ear length.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
45	♂	Malecon Morgue	5.0	6.1	7.1
10	♂	Japanese	5.3	6.3	6.7
104	♂	Igorots	5.0	5.8	7.0
22	♀	Malecon Morgue	4.6	5.9	7.3
10	♀	Igorots	5.2	5.6	6.0

Ear breadth.

45	♂	Malecon Morgue	3.1	3.6	4.3
10	♂	Japanese	3.2	3.4	3.8
104	♂	Igorots	2.7	3.2	3.8
22	♀	Malecon Morgue	2.8	3.4	4.2
10	♀	Igorots	3.0	3.2	3.5

The Igorots with the shortest ears have also the narrowest, but the Japanese with the longest ears have not such broad ears as the Malecon Morgue subjects. The longest ear and the shortest ear are found among the Morgue females, the widest ear is on a Morgue male, and the narrowest on an Igorot male.

Mouth breadth.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
47	♂	Malecon Morgue	3.0	4.9	6.0
10	♂	Japanese	4.3	5.0	5.6
69	♂	Igorots	4.0	4.8	5.3
21	♀	Malecon Morgue	4.0	4.7	6.0
10	♀	Igorots	3.8	4.4	5.0

Upper lip breadth.

49	♂	Malecon Morgue	0.4	1.0	1.4
10	♂	Japanese	0.6	1.1	1.4
69	♂	Igorots	0.8	1.2	1.3
21	♀	Malecon Morgue	0.6	0.9	1.3
10	♀	Igorots	0.8	1.1	1.3

The mouth of the Japanese is the widest, but the others are almost as wide, except the Igorot women, who have very narrow mouths. The lips of the Igorots are the thickest, and the lips of the female Morgue subjects the thinnest. However, it is not right to compare the lips of the living with those of the dead. There are, nevertheless, wide mouths and thick lips among the Morgue subjects.

Inter-eye distance.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
40	♂	Malecon Morgue	2.6	3.3	4.3
10	♂	Japanese	3.0	3.4	4.1
104	♂	Igorots	2.7	3.4	4.1
22	♀	Malecon Morgue	2.5	3.3	3.7
10	♀	Igorots	3.0	3.3	3.7

Eye breadth.

	♂	Malecon Morgue	2.5	2.8	3.3
10	♂	Japanese	2.6	3.0	3.3
104	♂	Igorots	2.6	2.9	3.5
22	♀	Malecon Morgue	2.3	2.7	3.1
10	♀	Igorots	2.5	2.8	2.9

The distance between the eyes is so nearly the same that no comment is relevant, except to note the fact. There is also little difference in eye width, although the Japanese have wider eyes than the Morgue subjects, and the men wider eyes than the women. The narrowest eye is in a Morgue female, the widest in an Igorot male. The narrowest inter-eye distance is in a Morgue female, the widest in a Morgue male.

Trochanter height.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
46	♂	Malecon Morgue	72.0	84.1	98.4
10	♂	Japanese	75.4	81.3	88.3
104	♂	Igorots	71.7	79.4	88.0
22	♀	Malecon Morgue	76.4	77.7	91.0
10	♀	Igorots	68.3	74.1	82.3

Pubic height.

10	♂	Japanese	72.6	79.6	84.8
104	♂	Igorots	68.0	77.6	88.0
10	♀	Igorots	64.0	71.6	77.3

The male Morgue subjects with less stature than the Japanese have a greater trochanter height, which indicates the Japanese to be short legged, or the Morgue subjects long legged. The women have shorter legs than the men. The pubic height indicates the same relationships. The pubis is relatively lower in the women than in the men.

Sternum height.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
42	♂	Malecon Morgue	121.0	130.9	147.0
10	♂	Japanese	123.6	131.2	141.6
104	♂	Igorots	92.0	125.3	138.6
21	♀	Malecon Morgue	111.0	123.8	142.0
10	♀	Igorots	111.0	119.4	125.0

The height of the sternum follows the stature, and is thus different from the height of the pubis and trochanter.

Umbilicus height.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
41	♂	Malecon Morgue	85.0	96.7	107.0
10	♂	Japanese	86.0	93.7	101.0
104	♂	Igorots	82.0	91.5	102.7
21	♀	Malecon Morgue	83.0	91.5	101.0
10	♀	Igorots	80.5	87.6	96.6

The height of the umbilicus has inverse relation to stature, the greater the latter, the less the former, except that the women with less stature than the men have a lower umbilicus, but it is relatively higher for the women, notwithstanding.

The omphalic index as determined for the Igorots is higher for the women than for the men, and if we may regard the pubic height of the Morgue men 1.75 centimeters less than the trochanter height, and the pubic height of the Morgue women 2.5 centimeters less than the trochanter height (the difference found for the Igorots and Japanese),[2] then the index for the women is 52.3 (Igorot women 50.0), and of the men, 42.0 (Igorot men 41.1), which confirms the fact that the omphalic index is much greater in women than in men. This is corroborated by further work at present under way.

Ankle height.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
46	♂	Malecon Morgue	4.4	5.89	7.5
10	♂	Japanese	5.2	5.77	6.1
13	♂	Igorots	3.5	5.40	7.8
22	♀	Malecon Morgue	4.0	5.50	7.0

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[2] The pubic height was not measured in the Morgue subjects.

Lower leg length.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
44	♂	Malecon Morgue	30.0	38.8	48.0
10	♂	Japaness	33.0	37.5	41.3
104	♂	Igorots	31.6	36.0	42.6
22	♀	Malecon Morgue	33.0	35.5	40.0

Upper leg length.

44	♂	Malecon Morgue	32.0	39.4	48.5
10	♂	Japanese	35.4	49.5	44.7
104	♂	Igorots	29.0	38.0	44.0
22	♀	Malecon Morgue	20.0	36.5	48.0
10	♀	Igorots	30.8	33.9	39.7

The ankle height of the Igorots is less than that of the others, as is to be expected from a previous comparison of the Igorots with other people. The lower leg of the Morgue males is longer than that of the others, absolutely and relatively, and the females, although not so long as the Igorots and Japanese, are relatively longer. The upper leg length of the Japanese and the Morgue males is the same and it is greater than that of the Igorots. The upper leg length of the Morgue females is greater than that of the Igorot females. The crural index (tibio-femoral) is greater for the Morgue subjects, which may be due to the greater proportion of Primitive and Australoid types among them, because these types have a higher crural index than any others.

Hand length.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
48	♂	Malecon Morgue	15.4	18.3	21.0
10	♂	Japanese	16.0	17.2	19.0
104	♂	Igorots	9.3	16.3	20.0
22	♀	Malecon Morgue	16.0	17.3	19.5
10	♀	Igorots	11.8	15.1	17.0

The hand of the Morgue males is the longest, and that of the Igorots is the shortest, as would be expected from a previous study of the Igorot hand, which is very short. The relative hand length (relative to stature) is the same for Igorots and Japanese, 10.6, but it is greater for the Morgue subjects, 11.3 for males and 11.5 for females.

Forearm length.

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
48	♂	Malecon Morgue	22.0	24.7	27.5
10	♂	Japanese	18.7	22.2	24.5
104	♂	Igorots	15.9	22.4	27.5
22	♀	Malecon Morgue	20.0	22.3	24.5
10	♀	Igorots	17.8	20.5	22.9

Upper arm length.

48	♂	Malecon Morgue	25.0	31.1	39.0
10	♂	Japanese	28.1	32.7	36.7
104	♂	Igorots	25.0	29.4	34.5
22	♀	Malecon Morgue	25.0	28.6	36.0
10	♀	Igorots	24.3	27.1	30.3

The forearm of the Japanese and Igorot is the same, but the Morgue males have longer forearms. The upper arms of the Japanese are longer than the others, and the Morgue males are slightly longer than the Igorots. The Morgue females are longer in each than the Igorots, but the forearm is relatively longer than the upper arm.

Irrespective of type, the Japanese have longer upper arms and short hands. Are these racial traits?

The brachial index (radio-humeral) is 79.3 for the Morgue males, 61.7 for the Japanese, 76.2 for the Igorot males, 77.9 for the Morgue females, and 75.6 for the Igorot females. The Japanese have either unusually short forearms, unusually long upper arms, or both, probably the last.

Shoulder breadth (tips of acromion processes).

No.	Sex.	Group.	Minimum.	Mean.	Maximum.
47	♂	Malecon Morgue	27.0	32.0	37.5
10	♂	Japanese	33.4	37.1	39.4
104	♂	Igorots	30.5	34.7	39.0
22	♀	Malecon Morgue	26.0	29.6	32.3
10	♀	Igorots	29.2	32.0	32.8

Hip breadth (iliac crests).

47	♂	Malecon Morgue	23.9	26.2	31.0
10	♂	Japanese	25.8	27.6	28.7
104	♂	Igorots	21.7	25.6	29.8
22	♀	Malecon Morgue	24.0	26.0	29.0
10	♀	Igorots	23.7	26.0	28.0

The Japanese have both wide hips and wide shoulders, whereas the Morgue subjects, both male and female, have relatively narrow shoulders compared with the Igorots. The relative hip-shoulder breadth of the Morgue females (88.2) is less than that of French women (91.8) or

Belgian (94.5), and that of the Igorot women is much less (81.2). The difference is due more to the shoulder breadth than the hip breadth, although the latter is also less for Filipinos than for Europeans. The Japanese have relatively broader hips and shoulders than either the Europeans or Filipinos, and the relative shoulder breadth is much greater than the relative hip breadth. The Igorot is similar to the Japanese.

Relative shoulder breadth (relative to stature).

No.	Group.	Sex.	Breadth.
47	Morgue	♀	19.6
10	Igorot	♀	21.8
30	French[a]	♀	16.3
47	Japanese	♂	22.9
10	Morgue	♂	19.9
104	Igorot	♂	22.5
40	French[a]	♂	18.9

Relative hip breadth (relative to stature).

47	Morgue	♂	15.9
10	Japanese	♂	17.1
104	Igorot	♂	16.6
40	French[a]	♂	16.9
47	Morgue	♀	16.0
30	French[a]	♀	18.4
10	Igorot	♀	17.7

[a] Topinard: Elèmènts d' Anthropologie Gènèrale. Paris, 1888.

SUMMARY.

The characters that differentiate the Japanese from the other groups are: cephalic index, which is the same as in the Igorots, but different from the others; long, high head and wide forehead; narrow nose, relative to the other groups; face both long and wide, but relatively longer than that of the other groups; relatively long ears; wide mouth; wide eyes; high sternum; relatively short forearm and lower leg, and relatively long upper arm and upper leg; and absolutely and relatively wide shoulders and hips. With a stature about the same as that of the Iberian and other characters simulating the European, the Japanese resemble the European more than do the other groups.

The characters that differentiate the Igorots are: small stature; long, narrow head; exceedingly wide nose; narrow mouth; short hand; and wide shoulder. . These all indicate the predominating influence or presence in great numbers of the Australoid.

The differential characteristics of the Morgue subjects are: broad head; cephalic index about the same as the Student; large nose, broader and longer than any other group; narrow eyes; high *trochanter* (long lower extremities); high umbilicus; relatively long lower legs, forearms, ankles and hands; and narrow shoulders. The discordant composite may be due to the large number of Iberian, Primitive and Australoid of comparatively pure type, although nurture can not be excluded as a factor.

The Students are characterized by tall stature; large, broad head; and other features that are more or less intermediate between the other groups. They probably represent a greater fusion of the European and Eastern types than the other groups, with a predominance of relatively tall broad heads. Nurture may have produced some effect in molding this group. The broad head may be due to studious habit, and the greater stature to better nourishment; but I am inclined to believe that both are due to the Chinese and European types as exhibited in the Alpine, B. B. B., and Adriatic, as well as in the majority of the blends.

The final conclusion, reached after a study of the four groups of individuals herein described, is that type has a greater influence than nurture during short periods of time, a few hundred or even a few thousand years. During the longer periods of time, especially with great change of climate, soil, food and water, as well as sociologic and economic conditions, nurture may play a greater rôle than type, although it can act only upon the elements present. Altering the words used, it may be said that during hundreds, or even thousands of years, heredity through variation is more important in molding the type of a people than is environment through modification; whereas environment may be of equal or greater importance during longer periods of time, especially if conditions are such as to favor rapid changes, either through stress and strain, or by different conditions of climate, soil, food, and drink.

It is a notable fact that the mestizo of the Iberian type presents a very unfavorable picture as seen from the results of my studies, whereas mestizos of the Alpine, B. B. B., and Adriatic types give a very favorable impression. The Iberians are small, delicate looking individuals with long, thin chests of the "habitus phthisicus;" 70 per cent of those measured in the Morgue died of tuberculosis; they form a greater percentage of Morgue subjects than of Students; they have the worst teeth and the lowest class standing of all Students; and they have practically disappeared from among the Igorots, either by absorption or by elimination through disease or otherwise.

On the other hand, the Alpine, B. B. B., and Adriatic are the most robust looking individuals; their stature is greater than that of any other types; they form a large number of the Students and practically never are found in the Morgue;[3] they have good teeth and their class standing is the best. These differences may be due to environment, but type is also a factor.

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[3] They do not reach the Morgue probably because they are of the better classes and are cared for by friends.

VI. THE RELATION OF MORPHOLOGY TO DISEASE.[4]

In a previous work (I. Filipino Types. Manila Students) I designated the types selected as new or elementary species, and suggested that some of the types might be true systematic or old species from which the new elementary species have been derived. The present work not only confirms that idea, but enables the two kinds of species to be differentiated. The Primitive and the Iberian may be called systematic or old species, whereas the Alphine, B. B. B., Modified Primitive, and Adriatic are elementary or new species which are at present in process of formation and are therefore not so stable and definite as the other two. The Australoid and the Cro-Magnon are intermediate between the old and the new, but they are fairly stable and may be called systematic species. The Blends represent what will probably be the elementary Filipino species, or the Filipino race, of the future.

Great interest attaches to this classification because of the association of different diseases with the Iberian, Primitive, and Australoid, as well as with the Blends. Sufficient numbers of the other species, if we may call them such, were not found in the Morgue to justify deductions. The following tables give the actual number and the percentages of causes of death for each species:

Filipino species of man with cause of death—Malecon Morgue, 1907–8.

NUMBERS ARE ABSOLUTE.

Species.	Tuberculosis.	Beriberi.	Senile debility.	Chronic enteritis.	Septicaemia.	Accident.	Carcinoma.	Pyaemia.	Chronic nephritis.	Other diseases.	Total.
Iberian or Mediterranean	9	------	2	1	------	------	------	1	------	------	13
Primitive	1	4	------	------	------	1	------	------	1	7	14
Australoid	------	2	------	1	------	1	1	------	------	2	7
Blend	14	2	2	------	2	------	1	1	1	4	25
Others	3	1	------	1	1	1	------	------	------	2	9
Total	27	9	4	3	3	3	2	2	2	15	68

PERCENTAGES.

Iberian or Mediterranean	70	------	15	8	------	------	------	8	------	------	100
Primitive	8	33	------	------	------	8	------	------	8	41	100
Australoid	------	30	------	14	------	14	14	------	22	28	100
Blend	56	8	8	------	8	------	4	4	4	8	100
Others	33	11	------	11	11	11	------	------	------	23	100
Total	41	14	6	5	5	5	2	2	2	18	100

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[4] Presented before the Manila Medical Society in May, 1909.

The majority of deaths are caused by chronic affections. Tuberculosis heads the list with 41 per cent of deaths, beriberi follows with 14 per cent, and then, in the order given, come senile debility, 6 per cent, chronic enteritis, 5 per cent, septicæmia, 5 per cent, accident, 5 per cent, carcinoma, 2 per cent, pyæmia, 2 per cent, chronic nephritis, 2 per cent, and other diseases, 18 per cent. The other diseases include 1 case each of heart disease, uræmia, diabetes, asthma, meningitis, chronic rheumatism, hæmorrhagic purpura, typhoid fever, influenza, myocarditis, bronchitis, chronic cystitis, liver abscess, and insanity. The clinical diagnosis was confirmed by autopsy in only 23 cases, and these are given at the end of this work.

The most significant facts are that 70 per cent of the Iberians, 56 per cent of the Blends, and 33 per cent of the other types died of tuberculosis, whereas only one Primitive and not a single Australoid died of it. However, 33 per cent of the Primitive, 30 per cent of the Australoid, and but one Iberian died of beriberi. This would indicate that the Iberian is more susceptible to tuberculosis than the Blends and other types, and the Primitive and Australoid are comparatively free from the disease. On the other hand, the Primitive and Australoid are prone to contract beriberi, and the Iberian is not.

I would not draw any far-reaching conclusions from this, but only suggest that the species to which any individual belongs should be taken into consideration in the etiology of such diseases as beriberi and tuberculosis. Other factors play a part: we know that the tubercle bacillus is supposed to be the cause of tuberculosis, but we also know that the soil must be ready or the tubercle bacillus is of no avail. Eating uncured rice is said to be the cause of beriberi, but the physical condition of the individual plays an important rôle. If it can be demonstrated that the Iberian is sedentary and a house worker, whereas the Primitive and Australoid are active open-air laborers; if the Iberian does not live largely on rice, whereas the Primitive and Australoid are heavy rice feeders; and if more extensive observations do not corroborate the present findings, then the suggestion fails. It is put forward simply as a plausible factor in the etiology of the two diseases, tuberculosis and beriberi.

We have, in conclusion, the following inferences:

The Filipinos were originally composed largely of two systematic species of man, which I have termed Primitive and Australoid. To these have been added Chinese and European elementary species, especially in the cities and along the littoral of the Islands.

The elementary species represented by the European and Chinese are now in greater abundance than the systematic species, and the blends constitute about one-half of the littoral population.

The European mestizos and the blends are apparently more liable to tuberculosis, whereas the original Filipinos are comparatively free from the disease, but succumb more frequently to beriberi.

NECROPSY RECORDS[5] OF FOUR IBERIAN FILIPINOS—MEDITERRANEAN RACE.

Morgue No. 44.—Clinical diagnosis: chronic tuberculosis. Anatomic diagnosis: pulmonary tuberculosis; tuberculous enteritis; postural contractures; tuberculous kidneys.

Morgue No. 180.—Clinical diagnosis: pyaemia genital organs. Anatomic diagnosis: pneumonia of left lower lobe and part of left upper lobe; chronic splenic tumor; acute nephritis; perineal and scrotal abscess; gangrene of penis; peritoneal adhesions.

Morgue No. 188—Clinical diagnosis: pulmonary tuberculosis. Anatomic diagnosis: chronic ulcerative tuberculosis of both lungs; chronic obliterative pleurisy right side; myocarditis and dilation of heart; fatty degeneration of kidneys; chronic splenic tumor; amœbic ulceration rectum.

Morgue No. 200.—Clinical diagnosis: intestinal tuberculosis. Anatomic diagnosis: chronic pulmonary tuberculosis; acute nephritis; acute and chronic amœbic dysenteric ulcerations large bowel.

NECROPSY RECORDS OF 5 PRIMITIVE FILIPINOS.

Morgue No. 22.—Clinical diagnosis: meningitis. Anatomic diagnosis: acute fibrinous and hæmorrhagic pleurisy right side; small abscesses left lung; accessory spleens; ulcers over left elbow; retention cysts, kidneys.

Morgue No. 43.—Clinical diagnosis: none. Anatomic diagnosis: broncho-pneumonia right lower lobe; œdema of lungs; healed ulceration of large bowel; chronic diffuse nephritis.

Morgue No. 140.—Clinical diagnosis: beriberi. Anatomic diagnosis: beriberi; dilatation of and hypertrophy of all chambers of the heart; general anasarca.

Morgue No. 39.—Clinical diagnosis: typhoid fever and tuberculosis. Anatomic diagnosis: typhoid fever; acute splenic tumor; typhoid ulcerations ileum; general gas bacillus infection; post-mortem changes of all organs.

Morgue No. 149.—Clinical diagnosis: beriberi; myocarditis. Anatomic diagnosis: broncho-pneumonia, both lower lobes; pleural adhesions, old, right side; acute splenic tumor; accessory spleen; acute diffuse nephritis.

NECROPSY RECORDS OF 4 AUSTRALOID FILIPINOS.

Morgue No. 29.—Clinical diagnosis: chronic dysentery. Anatomic diagnosis: amœbic dysentery; ulceration large bowel; chronic diffuse nephritis; cystic kidneys; ulcerative tuberculosis of right lung; obliterative pleurisy, right; œdema of left lung.

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[5] The records are from the pathological department of the Philippine Medical School.

Morgue No. 125.—Clinical diagnosis: acute beriberi. Anatomic diagnosis: dilatation and softening of the heart; fatty degeneration of the heart; œdema of ankles; anasarca; large, hard spleen; fatty degeneration of liver.

Morgue No. 143.—Clinical diagnosis: liver abscess and gall stones. Anatomic diagnosis: chronic fibro-pneumonia, left lower lobe; obliterative pleurisy, right lower lobe, with communication into large bronchus; chronic diffuse nephritis; chronic endocarditis, mitral valve.

Morgue No. 130.—Clinical diagnosis: carcinoma of left cheek. Anatomic diagnosis: carcinoma of left cheek, face and neck; œdema of lungs; healed tuberculosis of lungs; chronic myocarditis; chronic splenic hypoplasia; chronic cystitis; healed ulcerations large bowel; chronic obliterative appendicitis.

NECROPSY RECORDS OF 8 FILIPINO BLENDS.

Morgue No. 23.—Clinical diagnosis: general tuberculosis. Anatomic diagnosis: tuberculous pneumonia, left lower lobe; chronic ulcerative tuberculosis, left upper lobe; chronic gaseous tuberculosis, right lung; obliterative pleurisy, right side; miliary tubercles, ileum; tubercular ulceration, transverse colon; acute diffuse nephritis.

Morgue No. 28.—Clinical diagnosis: tuberculosis and beriberi. Anatomic diagnosis; tuberculosis; chronic ulcerative and gaseous, both lungs; pleural adhesions, right lung; obliterative pleurisy, left lung; cirrhosis of liver, early stage; ascaris infection.

Morgue No. 45.—Clinical diagnosis: intermittent fever. Anatomic diagnosis: septicæmia; cellulitis arm; periostitis; pustular skin eruption (smallpox?); post-mortem changes.

Morgue No. 174.—Clinical diagnosis: acute enteritis. Anatomic diagnosis: pneumonia lower left lobes; chronic tuberculosis both upper lobes; acute enteritis; chronic diffuse nephritis.

Morgue No. 194.—Clinical diagnosis: pulmonary tuberculosis. Anatomic diagnosis: acute dilatation of heart; œdema of lungs; ascites; chronic pulmonary tuberculosis; chronic diffuse nephritis; fatty degeneration of pancreas.

Morgue No. 203.—Clinical diagnosis: pulmonary tuberculosis. Anatomic diagnosis: chronic ulcerative tuberculosis, lower right lobe; obliterative pleurisy, right side; myocarditis and dilatation of heart; acute diffuse nephritis; acute splenic tumor.

Morgue No. 204.—Clinical diagnosis: pulmonary tuberculosis. Anatomic diagnosis: chronic pulmonary tuberculosis; pleurisy, right side; chronic endocarditis; chronic splenic tumor; acute and chronic nephritis; tuberculosis of lumbar vertebra; large psoas abscess, right side.

Morgue No. 201.—Clinical diagnosis: pulmonary tuberculosis. Anatomic diagnosis: pulmonary tuberculosis; chronic pleurisy, right side;

chronic diffuse nephritis; hydrocele, left side; chronic amœbic ulceration large bowel.

NECROPSY RECORDS OF 2 B. B. B. FILIPINOS.

Morgue No. 31.—Clinical diagnosis; chronic enteritis. Anatomic diagnosis; tuberculous enteritis; tuberculous peritonitis; chronic tubercular broncho-pneumonia, both lungs; chronic diffuse nephritis; hydrocele, left side.

Morgue No. 57.—Clinical diagnosis: pulmonary tuberculosis. Anatomic diagnosis: carcinoma of stomach: metastases of liver; emaciation; chronic tuberculosis of lungs and thorax; deformity from fracture of left tibia.

ILLUSTRATIONS.

PLATE I. Head outlines of Alpine and Primitive types. The solid line is a Primitive male Filipino, Morgue No. 205. The broken line is an Alpine female Filipino, Morgue No. 36.

II. Head outlines of three Iberian types. The broken line is a Filipino female, Morgue No. 113. The small solid line is a Filipino male, Morgue No. 76. The large solid line is a Japanese male, No. 65.

III. Head outlines of two Australoid types. The solid line is a Filipino male, Morgue No. 49. The broken line is a Japanese male, Morgue No. 11.

IV. Head outlines of two blended types. The broken line is a Japanese male, No. 64. The solid line is a Filipino male, Morgue No. 50.

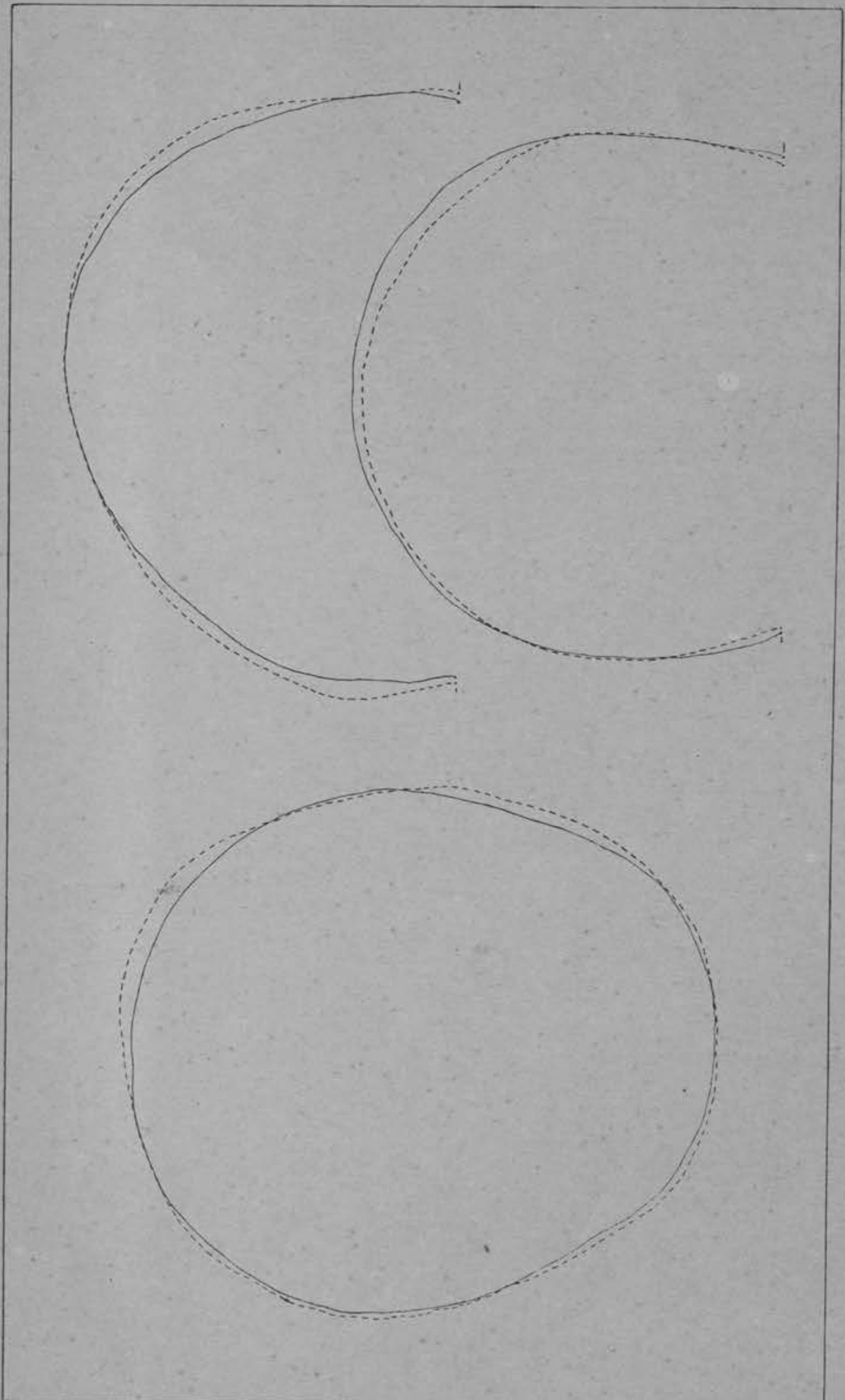
V. Head outlines of a Cro-Magnon and a Blend. The large outline is a Filipino male Cro-Magnon, Morgue No. 137. The small outline is a Chinese male Blend, Morgue No. 15.

CHART I. Cephalic Index and Nasal Index.

II. Crural Index. The relation of lower leg length to upper leg length.

III. Brachial Index. The relation of the forearm length to the upper arm length.

IV. Hip shoulder Index. The relation of the hip breadth to the shoulder breadth.



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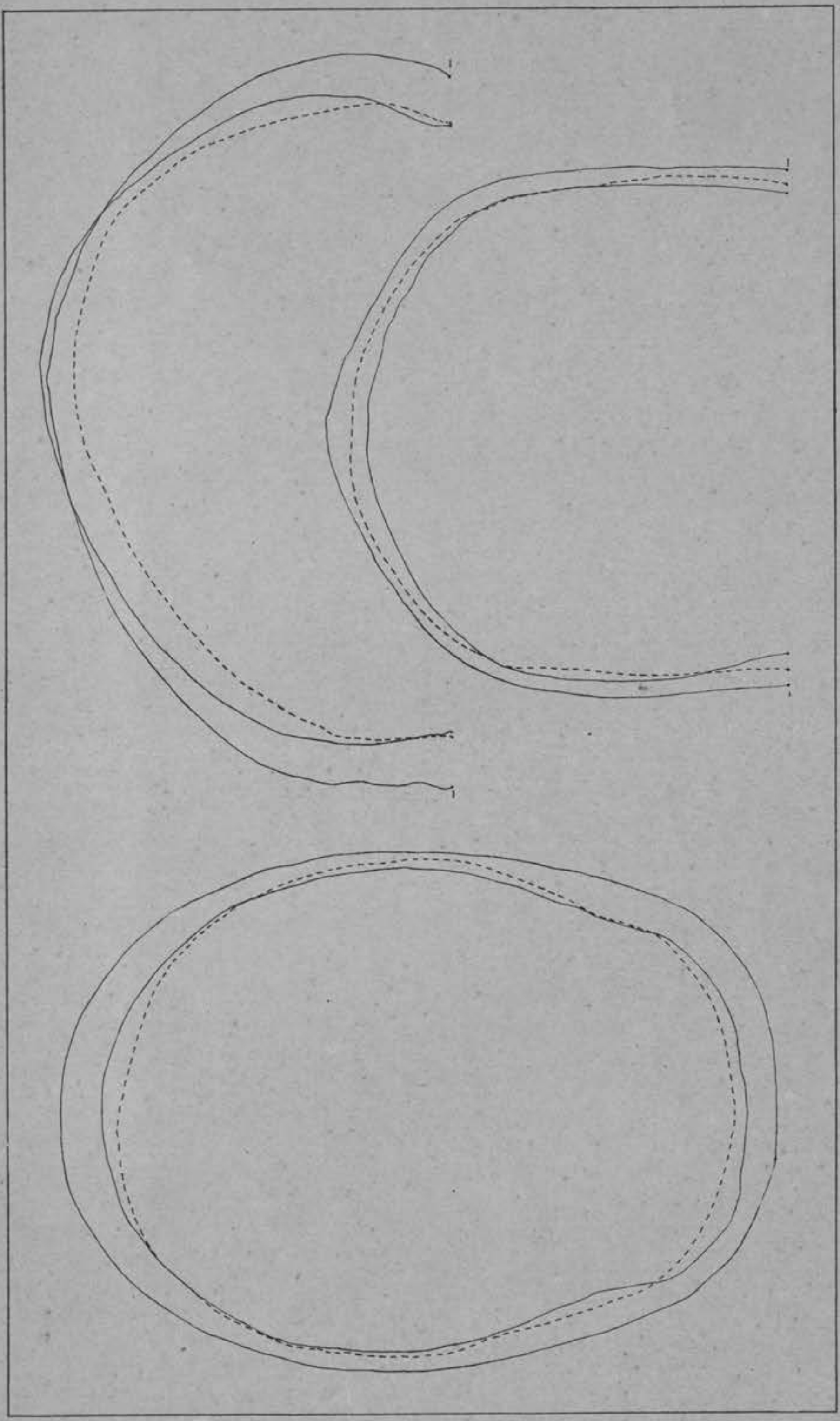

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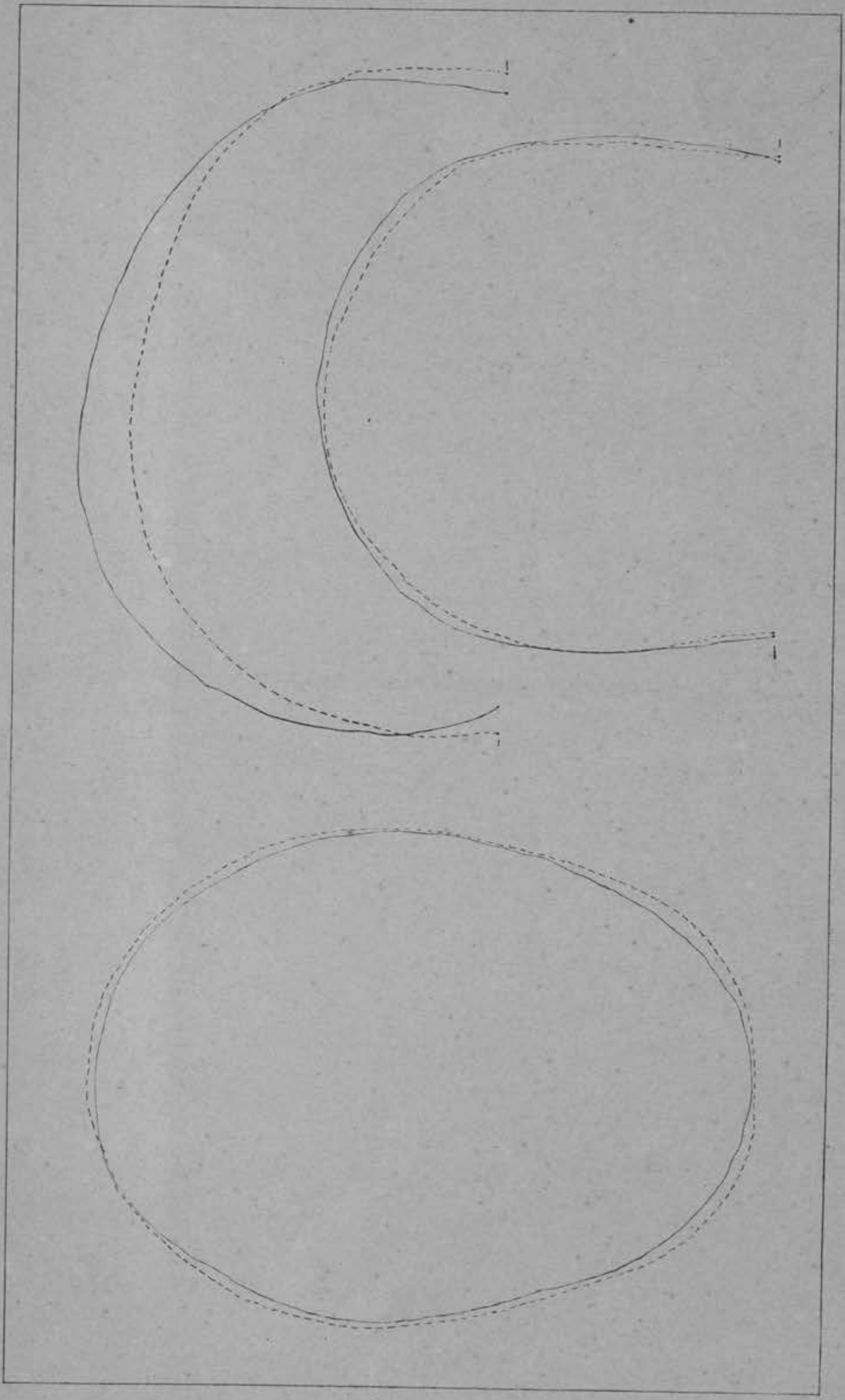

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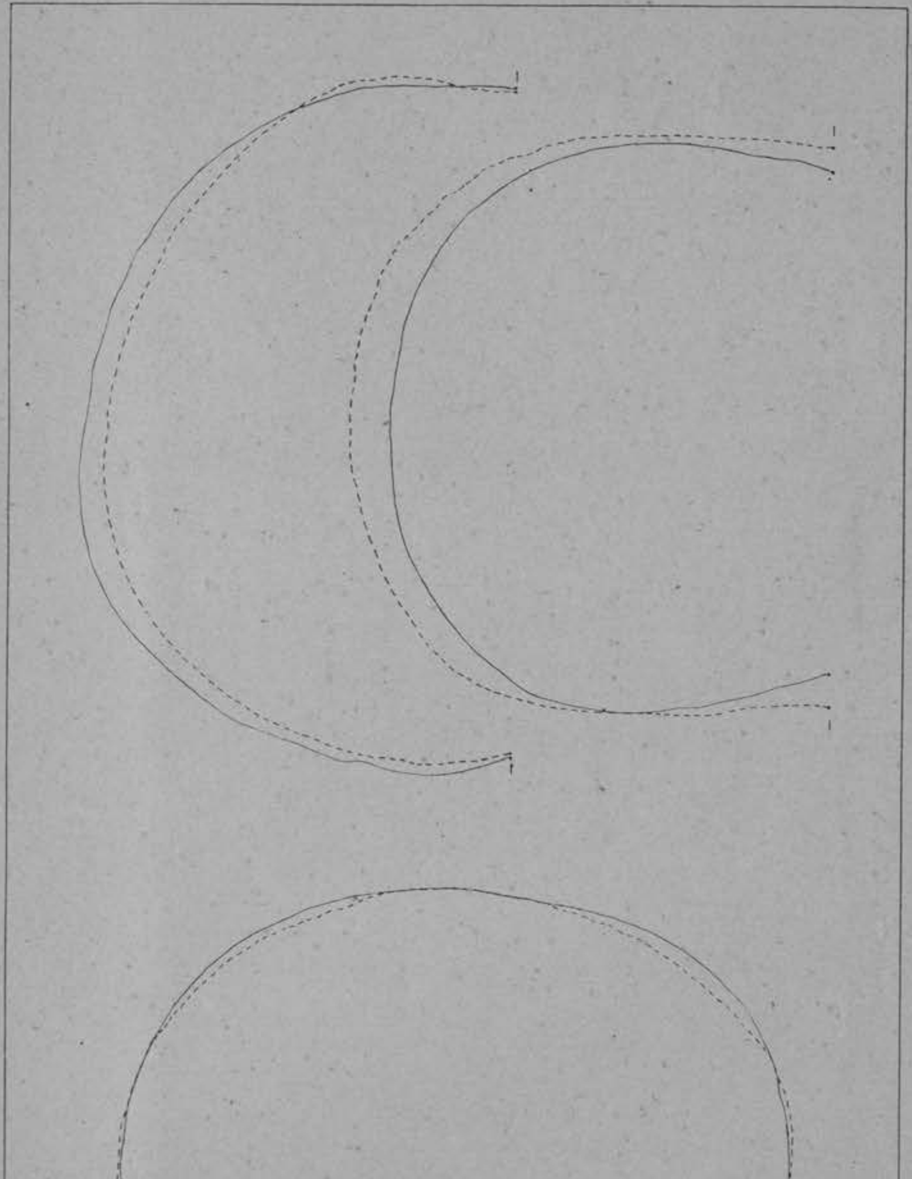

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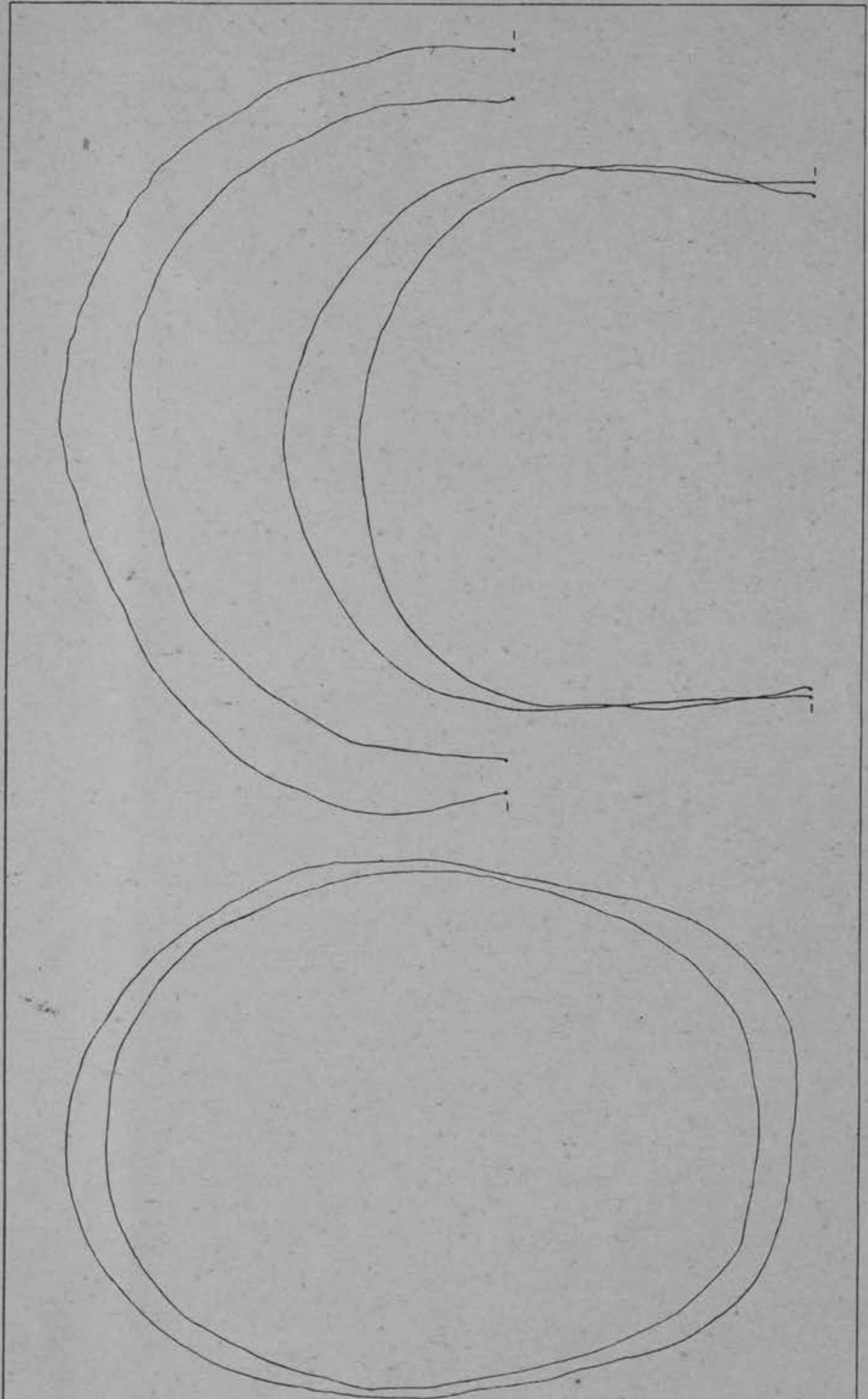

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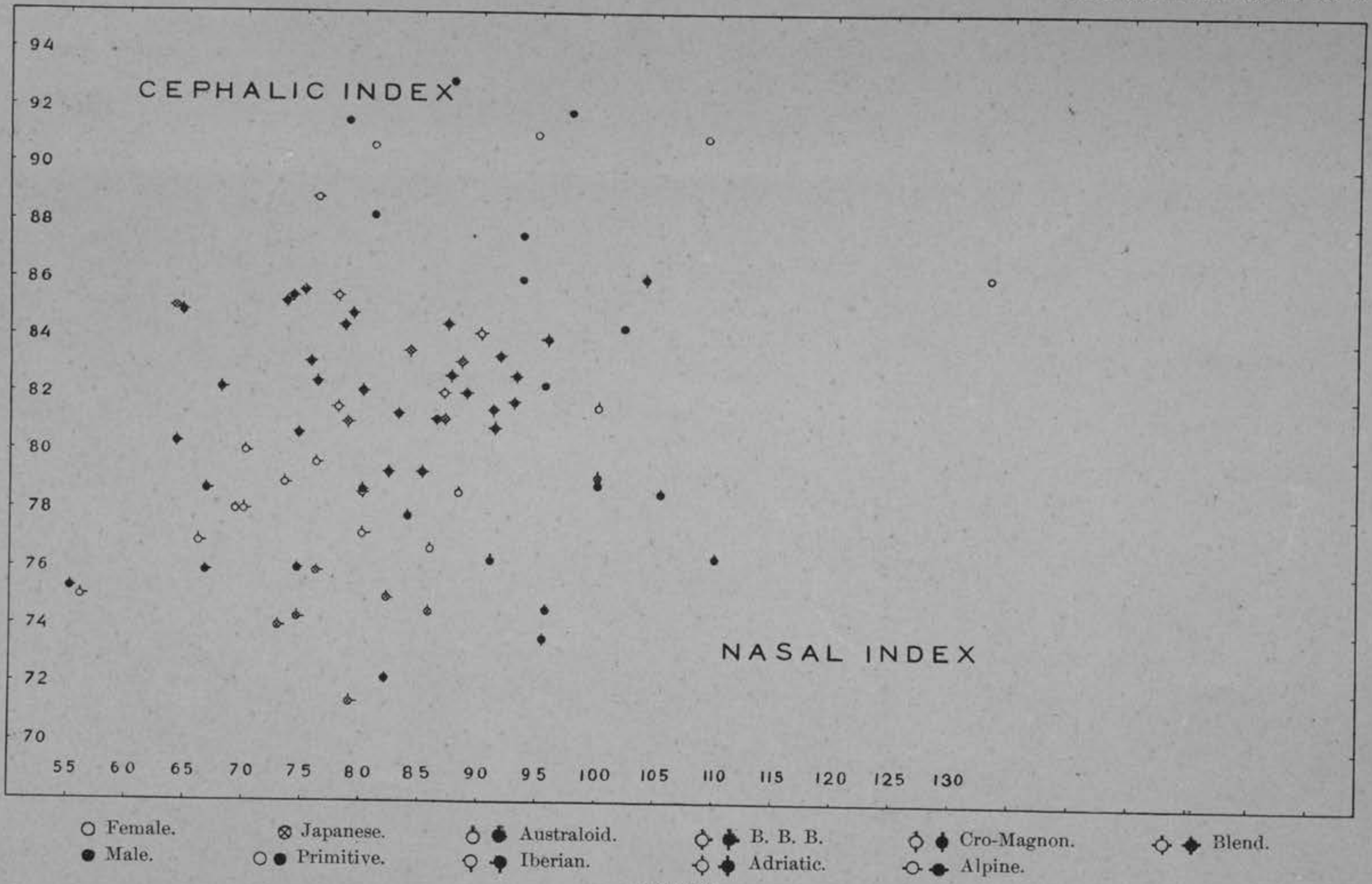
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● Male.
⊗ Japanese.
○ ● Primitive.
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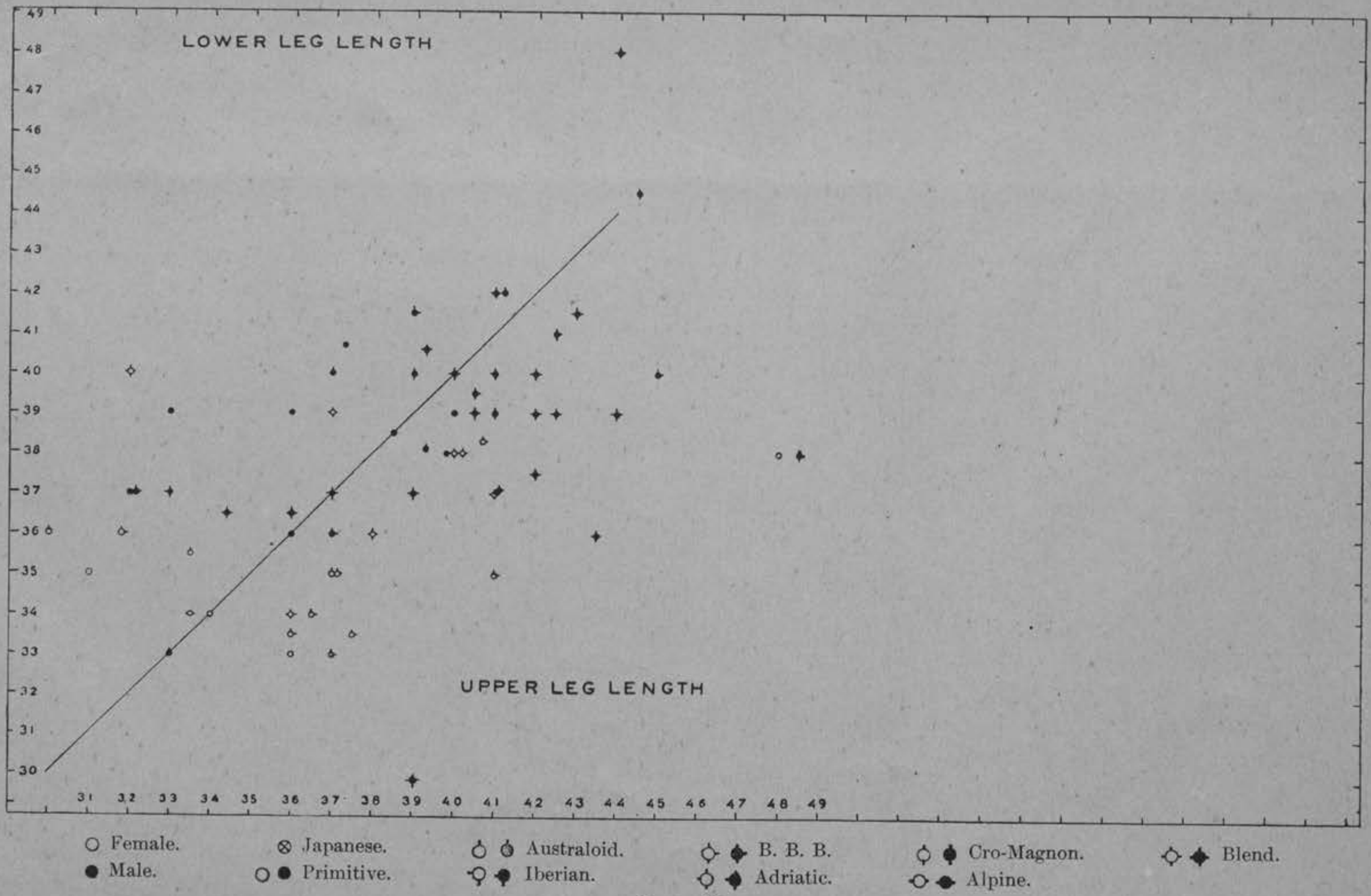
Iberian.
B. B. B.
Adriatic.
Cro-Magnon.
Alpine.
Blend.

CHART I.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⊗ Japanese.
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Iberian.
B. B. B.
Adriatic.
Cro-Magnon.
Alpine.
Blend.

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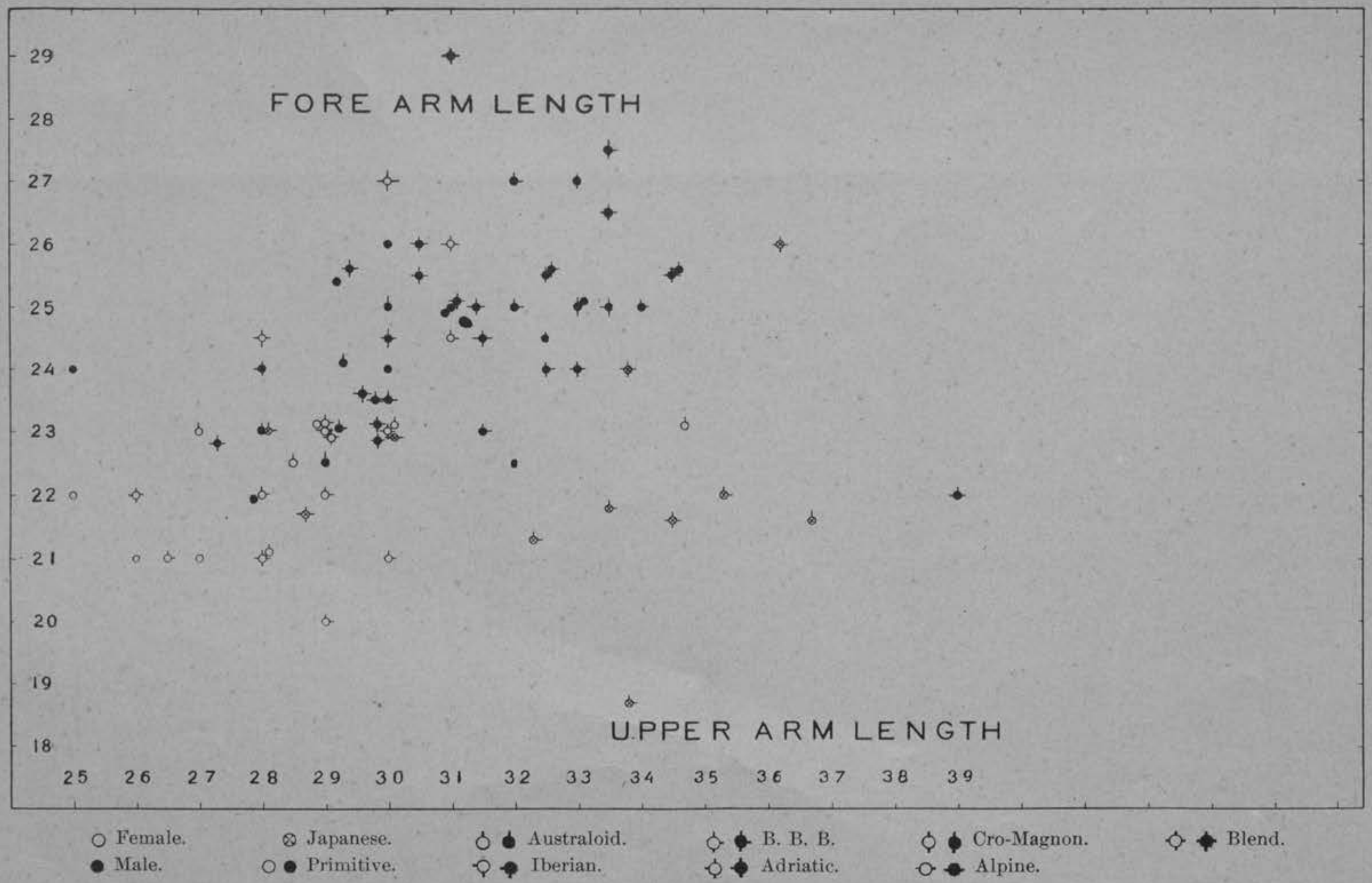
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○ Female.
● Male.
⊗ Japanese.
○ ● Primitive.
Australoid.
Iberian.
B. B. B.
Adriatic.
Cro-Magnon.
Alpine.
Blend.

CHART III.